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ABSTRACT

A study investigated the disparity between the English-as-a-Second-Language (ESL) competence of South African black children and the competence required to comprehend content subject textbooks. Two ESL schemes and two fifth-year general science textbooks were analyzed for differences in vocabulary, syntax, speech acts, cohesion and coherence. Results indicated that: (1) there was a large jump between the vocabulary taught in the schemes and the vocabulary used in the texts; (2) the relative proportion of new vocabulary in the science lessons was very high; (3) the speech acts and their pragmatic force were similar across schemes and texts; (4) the textbooks used a much broader range of syntactic structures than the schemes; (5) the schemes used a much narrower range of cohesive devices than did the textbooks, and did not explicitly teach the use of cohesive or coherence devices; and (6) of the two textbooks, the one with by far the more difficult syntax also had a much more constructive use of cohesion and coherence conventions. Findings suggest that children should be introduced to the conventions of expository text in their English schemes, and that textbook writers should be made aware of the language limitations of their audience. (Three figures representing the design of the study and 16 tables of data are included; a list of 130 references, a further analysis of content subject textbooks, 4 textbook passages chosen for analysis, a visual demonstration of impact of unknown vocabulary, a trial computer run on 100 sentences, syntactic structures and elements in textbook passages, and passages from the English schemes are attached.) (RS)

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The disparity between English as a subject and English as the medium of learning

H. van Rooyen

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Human Sciences Research Council
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1990

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PREFACE

The Threshold Project had its beginnings in a pilot project that was conducted in the Institute for Research into Language and the Arts in 1985. It emerged from this early research that black children are experiencing difficulties with the change of medium of instruction in their fifth year of schooling. At first glance it may have seemed that these difficulties arise purely as a result of ineffective language teaching methods. However, the complex nexus of factors that constitutes black primary education required a closer look at different aspects of the total teaching-learning situation.

The Anglo-American and De Beer's Chairman's Educational Trust Fund agreed to provide funding to the Institute for the Study of English in Africa to commission the Institute for Research into Language and the Arts to undertake a three-year project on the problems which had been identified. The research was undertaken under the project leadership of Dr C.A. Macdonald of the Division of Sociolinguistic and Psycholinguistic Research.

In the course of the project a broad range of tasks was covered, including language testing, cognitive developmental research, materials development and classroom practices. The results of the research are contained in five final reports and a main report which attempt to contextualise the understandings reached in the larger social situation in which the research was located; there was also a serious endeavour to locate the research in the context of state of the art thinking in specific aspects of education, language teaching and testing theory, and cross-cultural cognitive developmental research. The intention behind this broad endeavour is to open up questions of educational theory and practice for further discussion and research on an academic level, and also to provide a knowledge base for serious thinking on develpmental issues in the rapidly changing situation in Southern Africa.

The HSRC expresses its sincere appreciation to the Chairman's Fund for its funding of such a seminal project, and to the Institute for the Study of English in Africa for the invaluable part which its representatives played on the advisory committee of the project.

A final word of appreciation goes to Dr Carol Macdonald for the important role that she played throughout in the planning, conducting and completion of this groundbreaking project; also to Dr Rose Morris under whose aegis the major part of the project was conducted.

K.P. PRINSLOO
EXECUTIVE DIRECTOR: IRLA

November 1989.

FOREWORD

The Threshold Project, which has been carried out in the Institute for Research into Language and the Arts developed out of a pilot project conducted in 1985 on Std 3 children in the Department of Education and Training whose mother tongue is Sepedi and who started to learn through the medium of English from the beginning of Std 3. (The majority of black pupils in the different education departments start to use English as the medium of instruction (EMI) at this stage: the policy is technically known as "delayed immersion" in the bilingual education literature.) The research was significant in that it was the first to address an area that has been politically sensitive for perhaps a generation: certainly there has been no research on the outcomes of the present language policy since its institution in 1979.

The pilot research indicated that the standard of English that the children could control was poor, and that they were far less capable of handling "content" subjects, for example, general science and geography, through English, than through their mother tongue. While this research was being conducted, a request was made to the Chairman's Trust Fund of Anglo-American in Johannesburg that a three-year project be undertaken to examine the parameters of the children's difficulties more closely, and make recommendations for constructive change. This grant was received through the Institute for the Study of English in Africa (Rhodes University, Grahamstown), which has been represented on the advisory committee of the project. The project ran from 1986-1988 with senior and junior researchers, and research and administrative assistance, and the team numbered four or five members at any time. Helma van Rooyen, the author of this study was an assistant researcher on this project for its full duration.

The superordinate problem that the Threshold Project addressed itself to is the nature of the language and learning difficulties that Std 3 children experience when they change from the mother tongue to English as a medium of instruction. The project team was concerned to conceptualise the research in such a way that would facilitate the design of coherent and constructive strategies for change. It was felt at the project planning stages that this would best be achieved by focussing on five interrelated factors, namely, the linguistic difficulties experienced by the children, conceptual styles which might be culture specific, problems with content subject textbooks, disparities between English learned as a subject and English as required across the curriculum, and finally, school-based learning experiences. These factors were formulated into five main objectives, which became the foci of practical organization for the project. The objectives were as follows:

* firstly, to establish the nature and extent of the linguistic abilities of the black pupils in Std 2-3;

* secondly, to establish the nature of children's thinking skills using a model that would enhance our understanding of their performance on school learning tasks;

* thirdly, to describe the difference between what is expected of a child in Std 2 in English as a subject (conventional English second language learning), and what is expected of the same child when he starts to use English in the content subject classroom (i.e. EMI); *this aim is addressed in the present report, which is referred to as the "disparities" report elsewhere;*

* fourthly, to establish the nature of the child's school-based learning experiences and determine how they help or hinder effective learning, and

* finally, to produce principles intended to inform syllabus makers and curriculum developers.

Final reports have been produced on all the first four aims, and another final report was also commissioned. The fifth report documents the Std 3 general science research and development that was undertaken on the project. Hence there are five final reports, which constitute the second tier of official published project documents.

The consolidated main report is not simply a resume of the five final reports, nor a summary of principles and recommendations, but constitutes an integration of the analyses in terms of three parameters, i.e. the historical, the socio-cultural and the educational. These parameters are examined for their contribution to our understanding of the present situation, as well as to help understand the kind of change that might be possible at each level.

The project worked within the so-called "new" research paradigm in which qualitative and quantitative research is combined in the first level of description, and inferences are made to the second level of explanation, where an attempt is made to identify causal mechanisms underlying the manifest forms that we observe. In the case of the present report, quantitative and qualitative research are very finely intertwined. Quantitative testing helped us to empirically select the two textbooks that children found the most comprehensible; then it was Ms van Rooyen's task to give an account of what made each of these two texts comprehensible in their own way. One of the levels of analysis was to look at the textual structure or coherence in the language schemes and textbooks; apart from being able to posit its general importance as part of text processing, Ms van Rooyen also went into the classroom and found that Std 3 children are not at all familiar with the conventions of expository text.

Major areas of possible change that we identified - partly as a result of the present study - include the following;

* the reduction of the marked disparity between the junior and senior primary phase through vigorous curriculum development, where both themes and (cognitive) process skills are carefully built up; and,

* the adoption of radically new principles and practices of materials development; here we have in mind that the child should be drawn through the transition from basic interpersonal skills (BICS) (typical of early ESL courses) to cognitive academic language learning (CALLA) (central to using English as the medium of instruction).

It is also suggested that textbooks as they currently exist for Std 3 are wholly inadequate to the needs of the children, and an argument is advanced for the development of hybrid text-workbooks which would develop process skills together with language skills.

The final reports of the project cross-reference each other to a great extent: to help the readers of this report, we can direct them to other reports at specific chapters of this report. In Chapter One Ms van Rooyen gives an informal overview of the situation that black learners find themselves in; further description of the school context forms the basis of the "Schools-based Learning Experience" Report. In Chapter Two there is a review of the different ways of analysing texts; the importance of different levels of language skills is underlined in the "English Language Skills Evaluation" Report (Chapter Six), and the recommendations of the present report in Chapter Seven mesh very closely with the analysis of English as the medium of instruction, which is dealt with in Chapter Seven in the English Language Skills Evaluation Report.

The present study probably constitutes the most comprehensive comparative study of primary school text in the research literature to date; Ms van Rooyen has demonstrated that text analysis is not an enterprise for amateurs with calculators (ready to count syllables, words and clauses). Text analysis is a very specialized skill. One therefore hopes that educational publishers will take careful note of the techniques evolved in the research reported on here.

For the project as a whole, this research has provided a sound base from which to make confident statements about the kinds of text that children need, and usually don't get. It should pave the way for further specialized research on new forms of class texts, texts that will instruct teacher and pupil alike in the demands of expository text-workbooks through the higher primary phase.

C.A. Macdonald
Threshold Project Leader
June 1989

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I wish to acknowledge most gratefully the guidance and encouragement of my supervisors, Mr Norman Blight of the University of the Witwatersrand and Dr Carol Macdonald of the Human Sciences Research Council, who have given most generously of their time and attention.

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I greatly appreciate the opportunity afforded me by the HSRC to undertake this study while in their employ. Without its infrastructure I would not have come this far. My special thanks go to Pam du Toit, for remaining sane amongst so much chaos, the people at IRLA for their encouragement and the computer centre personnel for their unfailing patience.

My thanks go to the following schools in the Moretele Circuit of the Bophuthutatswana Education Department: Selang, Seroto, Lefofa and St Camillus. They always received us kindly and generously and without their co-operation this project would not have been possible.

I am especially indebted to the Anglo-American and De Beer's Chairman's Fund without whose monetary assistance it would not have been possible for me to undertake this study.

Finally I also wish to express my sincere appreciation to my husband for his unfaltering encouragement every time my determination was on the point of waning.

ABSTRACT

Children under the administration of the Department of Education and Training and the Bophuthatswana Education Department learn through the medium of their mother-tongue in the lower primary phase. The onset of the higher primary phase in Std 3 marks a transition to English as the medium of instruction. This transition causes many problems. One of these problems, the disparity between the English competence of the child in Std 3 and the competence required of him in order to read a content subject textbook with comprehension, is investigated in this study.

An innovative model of textual analysis is developed and used to analyse two English as a Second Language (ESL) schemes and two Std 3 general science textbooks. The two English language schemes analysed were MAPEP and New Day-by-Day, which were the most fully developed ESL teaching packages available when the study was started in 1987. The two science books were chosen from the results of a c-test, which showed that they were the most comprehensible of the available textbooks. One of the texts was clearly written with ESL readers in mind, and the other was more obviously written with mother tongue users in mind.

The schemes and the texts (two passages per text) were analysed with reference to differences on vocabulary, syntax, speech acts, cohesion and coherence. It was found that there was a large jump in the vocabulary taught in the schemes and the vocabulary used in the texts. The relative proportion of new vocabulary in the science lessons was very high. The speech acts and their pragmatic force were similar across the schemes and the texts.

There was a much broader range of syntactic structures used in the textbooks than in the schemes. It was assumed that many of the new syntactic structures could not simply have been learned incidentally by the children: up to 60% of the constructions could have presented problems to the children.

The schemes used a much narrower range of cohesive devices than did the textbooks, and neither did they explicitly teach the use of cohesive devices. The science texts themselves varied with respect to the use of cohesive devices, and it was found that the one was much more likely to make logical connections between propositions more explicit than the other.

The schemes, because they are principally concerned with the use of narrative text, do not teach any coherence conventions characteristic of expository text in textbooks. While the one textbook had far more difficult syntax than the other textbook, it had what we considered to be a much more constructive use of cohesion and coherence conventions.

When comparing the two textbooks, it was concluded that the policy of writing simple syntax, but losing out on helpful cohesive and coherence aspects (producing "impoverished text") could mean that the text is no more usable than one which has more complex syntax but more helpful cohesion and coherence.

It is suggested that specific attention should be paid to preparing the children in terms of a gradual introduction to the conventions of expository text in their English schemes. On the other hand, writers of textbooks should be made aware of the language limitations of the audience they are writing for. As matters stand we consider that the gap between the English subject competence ideally held by the children and the competence required for meaningful use of the texts is too great for any child to bridge.

Comprehensive strategies which publishers could use to increase the appropriacy of their materials for pupils are clearly laid out.

EKSERP

Kinders wat onder die administrasie van die Departement van Onderwys en Opleiding en die Onderwysdepartement van Bophuthatswana ressorteer, leer deur medium van hul moedertaal in die laer primêre fase. Die begin van die hoër primêre fase in st. 3 dui 'n oorgang na Engels as die onderrigmedium aan. Hierdie oorgang veroorsaak baie probleme. Een van hierdie probleme, naamlik die ongelykheid tussen die vaardigheid in Engels van die kind in st. 3 en die vaardigheid wat van hom vereis word om 'n handboek oor 'n inhoudsvak met begrip te lees, word in hierdie studie ondersoek.

'n Nuwe model van teksontleding is ontwikkel en gebruik om twee skemas vir Engels as Tweede Taal (ESL) en twee handboeke vir st. 3 Algemene Wetenskap te ontleed. Die twee Engelse taalskemas wat ontleed is, is MAPEP en New DAY-by-Day, die volledigste ESL-onderrigpakkette wat beskikbaar was toe die studie in 1987 begin is. Die twee wetenskapboeke is gekies uit die resultate van 'n c-toets, wat getoon het dat hulle die verstaanbaarste van die beskikbare teksboeke was. Een van die tekste is klaarblyklik geskryf vir ESL-lesers, en die ander een vir moedertaalgebruikers.

Die skemas en die tekste (twee passasies per teks) is ontleed met verwysing na verskille in woordeskat, sintaks, spraakhandelinge, samehang en bevatlikheid. Daar is gevind dat daar 'n groot sprong was tussen die woordeskat wat in die skemas geleer is en die woordeskat wat in die teks gebruik word. Die proporsie van nuwe woordeskat in die wetenskaplesse was baie hoog. Die spraakhandelinge en hul pragmatiese krag was soortgelyk oor die skemas en die tekste.

Daar was 'n veel breër reeks sintaktiese strukture wat in die handboeke gebruik is as in die skemas. Daar is aanvaar dat baie van die nuwe sintaktiese strukture nie net terloops deur die kinders geleer kon word nie: tot 60% van die konstruksies kon probleme vir die kinders opgelewer het.

Die skemas het 'n veel nouer reeks saambindmiddels as die handboeke gebruik, en hulle het ook nie die gebruik van saambindmiddels eksplisiet geleer nie. Die wetenskapstekste self het gewissel ten opsigte van die gebruik van saambindmiddels, en daar is gevind dat die een veel waarskynliker as die ander meer eksplisiete logiese verbindings tussen stellings sou maak.

Omdat die skemas hoofsaaklik gemoeid is met die gebruik van verhalende teks, leer dit geen bevatlikheidsreëls wat kenmerkend is van die verklaringsteks in handboeke nie. Ofskoon die een handboek 'n veel moeiliker sintaks as die ander gehad het, het die navorsingspan gemeen dat dit 'n veel nuttiger gebruik van samehang- en bevatlikheidsreëls gehad het.

Toe die twee handboeke vergelyk is, is daar tot die gevolgtrekking gekom dat die beleid van eenvoudige sintaks skryf, wat arm is aan nuttige

saambind- en bevatlikheidsaspekte (en dus "verarmde teks" produseer), kon beteken dat die teks geensins bruikbaarder was as die een wat komplekser sintaks het maar nuttiger samehang en bevatlikheid ingehou het nie.

Daar is voorgestel dat spesifieke aandag daaraan geskenk moet word om kinders voor te berei deur hulle 'n algemene inleiding te bied tot die gebruiksreëls van verklarende teks in hul Engelse skemas. Aan die ander kant moet skrywers van handboeke se aandag gevestig word op die taalbeperkinge van die lesers vir wie hulle skryf. Soos sake tans staan, is die navorsers van mening dat die gaping tussen die Engels vakbevoegdheid wat ideaal deur kinders bereik moet word, en die bevoegdheid wat vereis word vir betekenisvolle gebruik van die tekste vereis word, te groot is vir enige kind om te oorbrug.

Omvattende strategieë wat uitgewers kan gebruik om die gepastheid van hul materiaal te verhoog, word duidelik uiteengesit.

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CHAPTER 1

GENERAL INTRODUCTION

In this chapter the overall problem which has been researched is discussed, the specific problem area demarcated and the organisation of the study laid out.

1.1. THE SITUATION

Children under the administrations of the Department of Education and Training (DET) and the Bophuthatswana Education Department are educated through the medium of their mother-tongue in the Lower Primary phase, i.e. from Grade 1 to the end of Std 2 (the first four years of schooling). English Language Studies is introduced as a subject in Grade 2 (second year). (The children may or may not have had oral English classes in Grade 1 (first year), depending on individual school policy.) By the end of Std 2 (fourth year) the children will effectively have had about 365 hours of formal English instruction. From the beginning of the Higher Primary phase, Std 3 (fifth year), these children are expected to use English as their medium of instruction.

Unfortunately this language transition is not simply a transfer of skills or knowledge for the child; it creates problems which permeate many facets of the school experience of the children and it affects teachers and their methods, orientations and resources too.

1.2. COMPONENTS OF THE PROBLEM

We can isolate specific problems that affect the child, the teacher and the textbooks.

The language-medium transition entails all classes being conducted in English with the exception of two subjects, Afrikaans and the mother-tongue.

It has been the experience of the Threshold Project, conducted by the Human Sciences Research Council (HSRC) that the English proficiency of black Std 3 children can range from the ability to converse about common-place topics to an inability to comprehend even simple sentences such as "Have you eaten your lunch?" and "What is your name?". In other words, it seems that not all children are equally well prepared for the transition from the mother-tongue to English at the onset of the Higher Primary phase.

The Std 3 teacher may also feel the pressure of multiple demands. She is expected to conduct all her classes in English, while she is aware that not all her children can comprehend the English explanations she may have prepared. Teachers often counter this problem by repeating every lesson - once in the mother-tongue and once in English - or by teaching almost solely in the mother-tongue.

The teacher's own English competence may also not be of such a standard that she can adapt her register to suit the simple comprehension competence of her children. This is a skill that is difficult for ESL learners in general. The problem is further compounded by the fact that the mother-tongue may not have concepts equivalent to those being taught, with the result that the children have no appropriate background knowledge the teacher can activate through the use of quick digressions into the mother-tongue.

In the midst of such linguistic problems, the teacher also has a syllabus to cover. In fact almost no teachers finish their syllabuses in the allotted time. For example, Std 3 work could take one and a half years to cover or more likely is not fully covered. The process is repeated in the following years, creating a backlog the children carry with them to Std 10. Children at school are expected to learn more and more with the advance of technology and the increase in knowledge which accompanies it, with the result that content is continually moved down to lower standards and children have to learn more in a specific year now than they had to ten years ago. This phenomenon increases the pressure to teach an increasing amount of content in each school year. To cope with this pressure teachers tend to become more content-oriented and less child-oriented, especially from the Higher Primary years onwards.

It has also been the experience of the Threshold Project that, due to a shortage of properly qualified teachers of content subjects, other teachers are often expected to teach subjects for which they have not been trained. Such teachers may not feel confident that they know enough about the content or the didactics of the unfamiliar subject.

It thus becomes clear that the teachers may also find it difficult to help their children cope with the transitions associated with the Higher Primary phase.

A third component in the transition is the difference in texts the children and teachers use in the Lower and Higher Primary. The textbooks children use in the Lower Primary phase are mainly those comprising the language courses the children are taught by. Such English language teaching schemes typically consist of a teacher's manual in which the method of each lesson is described and a language exercise book and readers for the children. The texts in the language exercise books are not running texts, but short directive sentences, instructing the children to do a specific exercise. The reading texts provided are mostly folk tales, other narratives or short paragraphs about familiar topics such as visiting family, working and animals.

In Std 3 the children are given content subject textbooks in science, history, geography and health education, subjects which branch from the more general environmental studies of the Lower Primary. These textbooks are mostly written by content experts who are not familiar with the special content and language needs of the black child. They contain expository text only, about topics and concepts which are often new to the children and remote from their life experience, e.g. air compression, the lifestyle of the ancient Greeks and interpreting aerial maps. The language problems discussed above are usually not taken into account by the authors of these textbooks, partly because the same textbooks may be prescibed for all Education Departments and thus for both L1 and L2 speakers of English.

The Std 3 child, therefore, is not only faced with expository text conventions, unfamiliar content and the need to be able to read to learn, but the language in which all this information is couched may well be beyond his English competence (Gardner 1974; Munby 1976).

1.3. AIM OF THE STUDY

Three components of the language transition problem have been discussed briefly, i.e. the child, the teacher and the texts they use. This study looks at the linguistic problems surrounding the text component in more detail in order to determine whether the transition from Std 2 to Std 3 can be made easier for black children (in the situation described in 1.1 above) to cope with.

The specific aim of this study was to determine on the basis of a linguistic analysis whether General Science textbooks prescribed for black pupils in Std 3 are beyond their linguistic abilities and to make recommendations regarding desirable linguistic levels in the science textbooks. It was hypothesised that a wide disparity would be found between the language taught up to the end of Std 2 and the language used in Std 3 content subject textbooks.

An innovative model of textual analysis, developed by Van Rooyen and Macdonald (cf. section 2.3), was used to analyse the linguistic complexity and probable comprehensibility of both the textbooks and the texts provided by the language teaching schemes.

1.4. THE TEXTBOOK PROBLEM

The problem of a mismatch between the linguistic level of textbooks and the reading ability of their intended readership is neither new nor restricted to the education of black children in South Africa. Outcries against the linguistic level, register and use of textbooks have been heard for many years from different countries. The readability era (see section 2.1), for example, was marked by attempts to increase the com-

prehensibility of textbooks. Several European and American researchers have researched the disparity between textbooks and the linguistic and cognitive competencies of the children they are prescribed for and have advocated a careful matching approach to writing textbooks (Elliot ET AL 1986, Harlen 1985, Rosen 1979, Scruggs 1988).

Durojaiye (1974) reports linguistic and cognitive disparities between textbooks and Nigerian children, while Wegerhoff (1981;1981(a)) reports similar disparities for South African pupils.

The concern of all these researchers is mirrored in the following words of Rosen (1979:123):

> Who writes textbooks? ...Many seem to be written by people who have only read other textbooks; they may have been bigger and more difficult but they were textbooks none the less. The authors or compilers handle a grubby second-hand or umpteenth-hand language which they have accepted as part of the 'content' of the subject. They show little awareness of what pupils will make or fail to make of their language beyond some crude notions of easy and difficult vocabulary and shorter sentences... . Yet frequently it is in these books that pupils meet for the first time the written impersonal language of educated men.

In a similar vein, Hurd (1988:25) reports small differences between textbooks published in the 1960s and their later editions published in the late 1970s and early 1980s.

Textbooks should ideally be used to complement teaching through independent study (Engelbrecht 1975:7) and as source books (Davies 1986:102). However, Langhan (1987) reports that textbooks were mainly found to be used by teachers rather than by children in black schools. Teachers extract passages from the textbooks which the children are required to copy down and memorise verbatim as notes. In other words, extracts of language which is too complex for the children to comprehend IN CONTEXT - that being the reason teachers feel it necessary to produce notes - are now taken OUT OF CONTEXT, making them even more difficult to understand.

Textbooks then, seem rarely to be used as they were meant to be in local schools. Yet textbooks, when they are used correctly, have an important contribution to make towards teaching and learning. The assumption of this study is that, by determining the disparity existing between textbooks and the abilities of children and recommending ways of decreasing this disparity, textbook writers or textbook committees (cf. Chapter 7) will be able to produce textbooks which are comprehensible to the children using them. This study, which will attempt to determine the specific linguistic disparities between the language taught in two English Language Teaching schemes (ELT schemes) and the language used in two Std 3 general science textbooks, is intended as a contribution to the solution of this textbook problem. When the textbooks which are prescribed

for children are comprehensible to them, they might be used as they should be used and thereby make a contribution to the enhancement of the school experience and learning of these children.

1.5. STRUCTURE OF THE STUDY

In Chapter 2 an overview is given of text analysis literature while discussing the model of textual analysis in detail.

Due to the eclectic nature of the model used to analyse the texts, the methods of analysing the various aspects vary. In Chapter 3 the methods used to analyse the intra- and cross-sentential aspects of the textbooks and the schemes are explained.

The extent of the linguistic disparity between Std 2 and Std 3 is described in chapters 4 and 5. The results of the intrasentential analysis of the schemes and textbooks and the discussion thereof is presented in chapter 4. The results of the cross-sentential analyses are described and discussed in chapter 5.

In Chapter 6 a serendipitous finding of the textual analysis is reported on, namely the relative importance of different linguistic aspects of a text and the interrelatedness of their contributions towards text comprehensibility. This is thought to be a significant finding and one which could be further researched.

Chapter 7 presents the conclusions of this study and the recommendations which can be made on the basis thereof. The recommendations are mainly directed to authors of educational textbooks for specific target groups and to textbook selection committees who are responsible for deciding which textbooks would be appropriate for specific groups of children. A specific recommendation section, concerning the process of creating a new textbook, is aimed at the publishers of educational textbooks.

CHAPTER 2

MODELS FOR ANALYSING TEXTS

The identification of problems concerning textbooks was discussed in Chapter 1. This chapter will examine the different ways which have been proposed and used to analyse text in order to determine its appropriacy for a specific reading audience. The first main movement was the development and use of readability formulae to determine the readability of any given text. Partly as a reaction to this movement came the proposal and use of various models for textual analysis. These two movements will be discussed, followed by a detailed discussion of the model of textual analysis developed by Van Rooyen and Macdonald, which is proposed as a possible solution to the textbook problem discussed in Chapter 1.

2.1. THE READABILITY ERA

Readability formulae will be discussed in four stages, i.e. the nature of readability formulae, their origins, examples of studies which used readability formulae and the general criticisms against their use.

Readability studies are defined by Tekfi (1987:262) as studies which "are concerned with ensuring that a given piece of writing reaches and affects its audience in the way that the author intends". The main functions or categories of readability studies are threefold:

a To examine the level of legibility of printed material as well as its topography and layout.
b To examine the level of ease of reading due to interest or the aesthetics of the writing.
c To examine the level of understanding and comprehension due to the style of writing.

It is unfortunate that the meaning of readability has been narrowed to the last of the three categories through the years. What follows is a summary of the evolution of readability formulae, taken from a review of the literature published by Tekfi (1987).

Readability formulae as they are known today originated in the 1920s, but interest in readability factors goes back as far as 900 AD, when the Talmudists counted the number of occurrences of words and individual ideas in their scrolls to find out how many times these elements occurred in an unusual sense as compared to the usual meaning. However, the first scientific approach to readability only came centuries later. As early as 1889 the Russian N.A. Rubakin compiled a list of 1500 words which he believed to be most frequently used and understood by most people. He stated that the chief hindrances to readability were the use of unfamiliar vocabulary and excessively long sentences. Twenty-nine years

later in China, J. Yen selected 1000 frequently used characters to help in teaching labourers to read and write. On the basis of this readability study many schools were erected where people could learn basic literacy skills.

However, Sherman was to be the first person to use readability factors to predict the readability level of text. His findings, published in 1893, included the following important contributions to current readability studies:

a He stressed the importance of sentence length in text readability. Today sentence length is used in more formulae than any other variable.
b He used sampling methods instead of evaluating an entire work.
c He emphasized that authors should write as they speak to be comprehensible.
d He also emphasized acknowledgement of the reader and his abilities.

Further important contributions towards recent research on readability formulae came from the psychologist Kitson. He was the first person to consider word length measured in syllables as a readability factor. He also declared that psychological differences such as individual taste and interest are relevant factors in text readability.

The third important contributor to readability research was Thorndike, who published a word frequency list in his book The Teacher's Word Book in 1921.

On the basis of the work of Sherman, Kitson and Thorndike, two types of readability formulae were developed - formulae to determine the readability of children's text, and formulae used to evaluate text meant for adults.

The first of many formulae was based on Thorndike's word frequency list and published by Lively and Pressey in 1923. However, the prototype modern formula was not produced before 1928. Currently Tekfi lists twenty-five different readability formulae measuring children's material and twenty-seven measuring adult texts (1987:265,267).

The work of Dale, Waples and Tyler marked the beginning of work on adult formulae. One of the most fruitful studies on readability published thereafter was led by Gray and Leary in 1935. They investigated the individual and interrelating contribution of 228 factors, the most important of which include measures of sentence length, familiarity of vocabulary, the use of pronouns and prepositional phrases and the number of syllables.

The popularity readability formulae enjoy today is mainly attributable to Rudolph Flesch, and his revised formulae which measure reading ease and human interest respectively. The Flesch Reading Ease Formula and the Fry Readability Graph were used for example in the readability study reported by Wegerhoff (1981), which aimed to determine the level of readability of biology textbooks used in secondary schools. This is but one example of the way readability formulae have been used, and is spe-

cifically interesting because it examined the readability of content subject textbooks in the South African context.

Another example of the use of readability formulae is the study reported by Johnson, a teacher in the U.K. who is concerned with the writing of educational textbooks. He illustrates the use of the Gunning Readability Test, the Fry Readability Graph and the McLaughlin Readability Test to determine the readability of physics textbooks. He also emphasizes the other two categories of readability, i.e. interest and motivation and legibility of print. He focusses on the linguistic category of readability and gives helpful suggestions such as the following (1979:562-3):

a Teachers can improve external interest and motivation of children by approval, merit marks and success in tests and other tasks.
b Lower case print is read 10% faster than running text in capital letters.
c For emphasis, **bold** type is read more quickly than *italics* or CAPITALS.
d The size of the margin does not affect reading speed, but too narrow a margin may cause eye fatigue.
e Black type on white paper is more readable than any other colour combination.

For a time the limitations of readability formulae were disregarded and the formulae were seen to be the ultimate solution to all text comprehensibility problems. The result was that authors and publishers sometimes lost sight of their human reader audience and wrote text courting readability formulae, texts which were designed to obtain good readability scores. Texts which already existed were merely simplified by reducing the sentence length and replacing vocabulary items, thereby losing most logical connectives in the text. Texts like these would typically have short sentences and familiar, short words. This type of text bred discontent amongst the people who had to use them, and especially amongst educationists (Alderson & Urquhart 1984; Gardner 1974; Munby 1976; Wegerhoff 1981(a)).

Even the developers of the readability formulae warned people about the limitations of their own formulae. It was emphasized that good readability scores do not necessarily make a text well-written while some were concerned that the sole use of books with good readability scores might lead to low reading ability among children.

The following quotes illustrate the fact that these developers of the readability formulae were aware of the limited value of their products:

"There is, though, only one acid test for readable writing: Does it really communicate with the audience for whom it is intended?" (Fry 1979:41)

"We need to find better ways of measuring conceptual difficulties ... style ... (and) optimal readability standards for communication and learning." (Chall 1979:40)

Wegerhoff summarises this concern when he concludes that a good readability score does not guarantee comprehension because the simplification of a text in terms of sentence length and syllable counts "may increase the difficulty of the reading task by rendering explicit relationships obscure" (1981(a):21,22). He adds that conceptual complexity and discipline-specific terminology may require more complex language by virtue of their very nature.

As a reaction to this awareness that readability formulae alone could not fully predict the readability of any text, different models for textual analysis were developed.

2.2. MODELS OF TEXTUAL ANALYSIS

The models which were developed because readability formulae did not fulfil the total need range from concentrating on one linguistic aspect such as syntax or coherence to studies which used a selection of aspects from the three categories of readability mentioned in section 2.1. Examples of such models for textual understanding, their functions and shortcomings will now be discussed.

Conn proposes criteria for evaluating textbooks used in educational contexts. These criteria, which were originally put forward by Donald A. Eklund, vice-president of the school division at the Association of American Publishers Inc., and which she calls "widely accepted criteria", are as follows (1988:31):

a Do the headings suggest a forward-moving framework controlling the presentation of content?
b Are units manageable in length, is the presentation balanced and is content reinforced?
c Are questions meaningful and integrated into the text?
d Is the content appropriate or too ambitious, or does it underestimate the intended readership?
e Are the resources suggested freely available?

Without detracting from the validity of these questions, the problem with such a model for analysing text is that it covers only a part of one linguistic aspect of readability, namely coherence (as defined by Williams 1985:56).

The model proposed by Durojaiye (1974) has a similar problem in that it analyses only the aspects of syntax and vocabulary. It thus looks at two aspects of linguistic readability only and does not take into account the categories of legibility and interest and motivation. This model is intended for use by East African teachers, irrespective of the subjects they teach. This simple technique of text evaluation harks back to the readability formulae in that it involves the calculation of the occurrence of unfamiliar vocabulary, mean sentence length, degree of subordination and an examination of the verb forms used. This information, however, is not converted into a score, but it is compared to the con-

clusion Durojaiye has come to, i.e. that "sentences of 20-24 words with more than one subordinate word group" and "6 or 7 new vocabulary items in every 10 lines of text" is too difficult for the average L2 pupil in his first year of secondary school (1974:210).

A third model, suggested by Giordano (1987), involves not only coherence or only intrasentential aspects of text, but looks at the contribution of certain aspects of coherence, vocabulary and the factor of interest potential for the intended reader. He drew up an *Open Textbook Inventory* which teachers can use. The teacher asks a sample of children for whom the book is intended questions about inter alia the use of the table of contents, the index, the use of pictures, the structure of paragraphs, the background knowledge of the child etc. The full list of questions can be found in Appendix 1.

The weak point all three models share is that they do not fully cover the whole spectrum of known readability factors. However, it has to be kept in mind that these models were meant to be easy guidelines for non-experts such as content subject teachers. They are not based on comprehensive research or linguistic theory, but were felt to be adequate for the purposes they were designed for. For the purposes of this study a more comprehensive model for textual analysis was needed, one which would consider additional factors and which would lead to a comprehensive analysis of the text.

A model that aspires to cover more than a selection of readability factors, is that developed by Dallas and Williams for the Longman group of publishers (no date).

In his manual intended for authors and editors of educational textbooks, the first one of its kind, Williams (1985) includes the aspects of familiarity and introduction of vocabulary items, as well as certain aspects of sentence complexity, cohesion and coherence and punctuation. All aspects are dealt with in the form of advice such as "Avoid inversions", "Repetition may occasionally be better than substitution" and "Tabulation is often more readable than prose" (1985:vi,vii).

An analysis such as Williams suggests will result in a fairly comprehensive overview of the complexity of the text at hand. However, he does not look at the interrelationships between the aspects, nor at the aspect of human interest and motivation. The aspects of legibility of print are not fully discussed either and the advice given about syntax, cohesion and coherence does not promote a full analysis of these linguistic factors, so that the albeit comprehensive overview which results from the analysis is not as complete as was required for this study.

These reservations can be explained by the fact that authors and editors of textbooks are not necessarily linguists. It is also very difficult to find embodied in one person someone who is an expert on linguistics, psychology and the mechanics of printing, therefore it is unlikely that a model for textual analysis will represent all three of these fully. However, Chapter 7 attempts a solution to this complex problem.

I will now discuss in detail the model for textual analysis developed by Van Rooyen and Macdonald, and explain why it is proposed as a possible solution to the textbook incomprehensibility problem which black children in South African DET schools experience.

2.3. A PROPOSED MODEL FOR TEXTUAL ANALYSIS

The model which is proposed attempts a synthesis of research done on textual analysis in different theoretical fields. Comprehension of a text is made possible by a complex network of factors such as the familiarity or unfamiliarity of vocabulary, complexity of the syntax, understanding the meaning of sentence patterns and punctuation marks, coherence, cohesion, interest, motivation, mediation by the teacher etc. (Durojaiye 1974; Gould 1977; Lanham 1987). Various factors affecting comprehensibility of a text have been identified by researchers through the years. This model for textual analysis now integrates several of these factors. (See Figure 2.1 for a complete schematic representation of the model.) This model is therefore eclectic. Existing theories about various textual aspects have been drawn together in an attempt to get an overall linguistic and meta-linguistic view of a text. It is not in the theories that the innovativeness of this model lies, but in its eclectic composition.

The biggest problem with an eclectic model is that various theories might be incompatible; their underlying assumptions about language and its comprehension may not be the same. This problem does not arise in the use of the model for textual analysis, because the different theories are not mixed into one overall theory about comprehension, rather they are used to look at one text from a variety of viewpoints and at different levels, thus ensuring full coverage of each aspect of the text. The analyst using the model then 'combines' the results of different theories in order to come to a more comprehensive understanding of the problems involved for the child who has to read the text.

In order to use the results of such an analysis to full advantage, the analyst needs to have a fair knowledge of what his target group is capable of linguistically on the one hand, and of what a specific L1 or L2 age group can be expected to know on the other hand. The analyst can then use this knowledge to make informed judgements about the possibility that a certain construct will be comprehended. It is necessary for him to be able to do this, as it is virtually impossible to empirically test every aspect of textual comprehension and linguistic competence of a target group. (Such informed judgements were made when interpreting the cross-sentential data, cf. chapter 5.)

It might have been easier to test comprehension of specific textbooks by the target group in order to decide on their appropriateness. However, such a test would not provide guidelines for future evaluation of textbooks, which is what this study hopes to establish. As the use of this model has proven valuable in this study, it could be used as a framework with which other textbooks can be evaluated as appropriate or not for the target group. This model could then be used by publishers of text-

books for children, so that newly published books would be truly appropriate for the intended readership. Only if textbooks are comprehensible to their readers can the textbook problem as discussed in Chapter 1 be alleviated.

When analysing a text, both linguistic and non-linguistic aspects can be analysed. The **non-linguistic aspects** can be divided into three components, i.e. the technical aspect, the psychological or cultural aspect and the aspect concerning the actual use of the text in the classroom. Although the linguistic aspects will be the main focus of this section, the parameters of the non-linguistic aspects will be discussed briefly.

The technical aspect concerns itself with the legibility of a text. Legibility is one of the original factors used to discuss the readability of a text, but has been neglected in favour of the linguistic aspect embodied in most readability formulae. A text is legible when its letters and words can be perceived accurately, rapidly and with understanding. Optimal legibility of print is achieved when the letters, words and other typographical factors such as type face, line width, page length, graphics etc. are arranged in such a way that it facilitates comfortable vision and easy and rapid comprehension (Tinker 1963:8).

Thus a legibility analysis of text would include factors such as type face, page length, line width, margin width, spacing, colour of ink, corresponding colour of paper and the lay-out of the page. These technical factors should be manipulated to produce text which is optimally readable for the target group.

The psychological-cultural aspect concerns the background knowledge, interest and motivation of the reader. In the instructional arena the notion that background knowledge about the content of the text and the culture of the author helps determine what the reader will understand has long been acknowledged (Alderson & Urquhart 1984; Armbruster & Anderson 1988; Beck et al 1986; Hewson & Hewson 1982; Manghubai & Elley 1982; Murray 1985; Rosenbusch 1987, Steffensen et al 1979; Steffensen 1986; Zelan 1985). The schema theory of reading regards reading as an interactive process in which the reader retrieves meaning from the text by using the knowledge he has already acquired about the topic (Florez & Hadaway 1987; Murray 1985:5).

Steffensen has led several research programmes on the influence which content and cultural background knowledge have on reading comprehension. The following conclusions can be extracted from her reports (1979,1986):

a If reader and writer share the same cultural background, reading will be facilitated; if not, there will be interference.
b Mention of the topic early in the text can call up the appropriate schemata for interpreting the text.
c Absence of the appropriate background can result in problems in comprehending even explicitly stated facts: facts may not be processed during reading because they cannot be integrated with other information in the text; or they may be distorted to correspond to an event consonant with the native culture.

d The processing of cohesive devices in a text may be affected by the depth of background knowledge.

The factors interest and motivation of the reader were also included in the original readability analyses, but they have been neglected with that of legibility. It was hypothesised that the comprehensibility of a text will be increased if the reader is interested in the topic and motivated to read about it. If the reader is interested in the topic he will be willing to spend more time interpreting the text. Because he is interested in the topic he will read more about it which will increase his background knowledge of that topic. This increased knowledge about the topic in turn increases comprehension of more complex text about the topic.

The more motivated a reader is to read a text, the more he will comprehend what he reads, because he has the motivation to overcome linguistic and non-linguistic difficulties posed by such text.

Parents and teachers can increase childrens' interest and motivation to read by providing children with ample reading material and by praising and encouraging them.

In summary, background knowledge, interest and motivation will affect the degree of comprehension a reader reaches, and should therefore be taken into account when determining the appropriacy of a text for a specific readership.

The purpose a text will serve in the classroom may also affect its appropriacy for the target group, and should therefore also be taken into account when analysing educational text.

Among the questions which should be answered in order to make an evaluative statement about a text's usability in the classroom are the following:

a Are the suggested resources freely available (Conn 1988:31)?
b Does the teacher get appropriate, too little or too much guidance with the structure and method of the lesson?
c If the book is to be the primary source of information, is its information comprehensive and correct (Davies 1986:102)?
d If the textbook is to be used by the children alone, can they interact with it or is it a passive source book (Davies 1986:109)?

The analysis of these three non-linguistic factors would require the services of specialists in different fields. The analysis of the legibility of a text would require the services of printing experts, the analysis of the psychological-cultural aspects would require the services of, for example, anthropologists and developmental psychologists, and the analysis of a text's success in the classroom would require teachers in the field. The analysis of these aspects will not be discussed in more detail, but their application will be discussed in Chapter 7. The rest of this section will be devoted to the detailed discussion of the linguistic aspects which affect comprehension of a text.

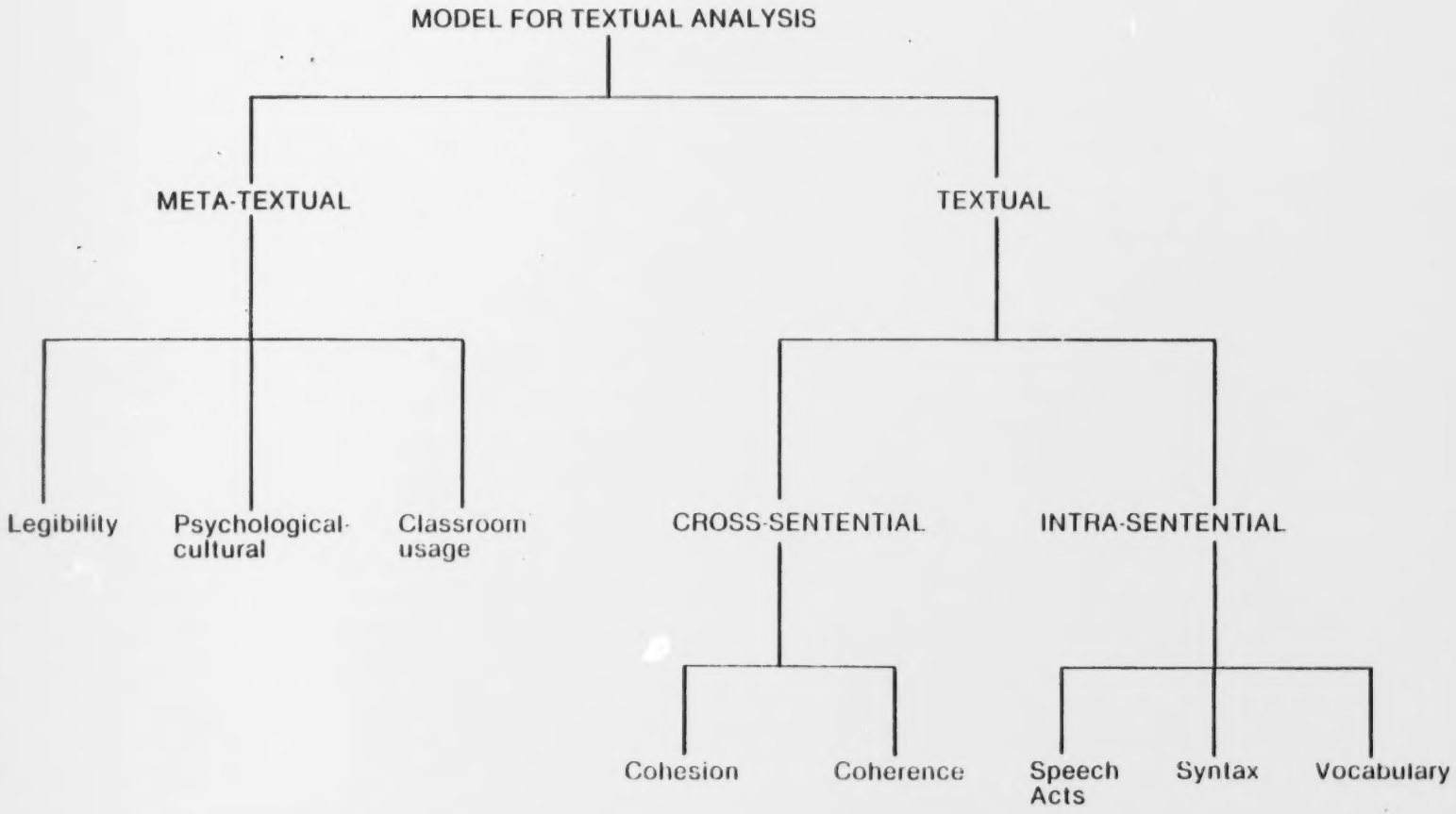

Figure 2.1: Schematic representation of the model for textual analysis

It should be stressed that this study is not directed at the nature of interactive reading processes; it is devoted to the analysis of text.

The linguistic aspects can be analysed in one of two ways - cross-sententially or intrasententially. The cross-sentential aspects, coherence and cohesion, concern more than one sentence at a time, whereas the intrasentential aspects, speech acts, syntax and vocabulary, concern the complexities of one sentence at a time. The two cross-sentential aspects will be discussed in detail before the intrasentential aspects are examined.

The terms coherence and cohesion when used in this study do not refer to coherence and cohesion as they are used in discourse analysis by Coulthard (1977:9).

2.3.1. Coherence

Text structure has become an important notion in reading comprehension in recent years. The term text structure refers to the specific organization and use of vocabulary, syntax, headings, overviews etc., which allow differentiation between text types such as narrative and expository. It also allows finer distinctions to be made between types of expository text such as comparison/contrast, method/conclusion and problem/solution (Armbruster 1986; Armbruster, Anderson & Ostertag 1987; Armbruster & Anderson 1988; Finger 1987; Kintsch & Yarbrough 1982; Lehr 1987; Morrow 1982; Negin 1988; Ohlhausen & Roller 1988; Whaley 1981). Studies have shown that a knowledge of these structures facilitates reading comprehension, while an absence of such knowledge interferes with comprehension of the text (Armbruster, Anderson & Ostertag 1987; Kintsch & Yarbrough 1982; Raphael, Kirschner & Englert 1988). When a reader knows a specific text structure, he is said to have acquired the appropriate textual schema for that structure. Cues signalling the use of a certain text structure then trigger the use of the appropriate schema, thereby making the relevant information available about the structure being used (Kintsch & Yarbrough 1982). These textual schemata allow the reader to organize the information presented to him hierarchically, and to form a global summary of the information in the text. Such a global view of the text is necessary for good comprehension. However, global summaries can only be made if the reader possesses a textual schema for the text structure being used. Without knowledge of the text structure the reader will perceive all information as equally important and will only be able to produce a list of the points made (Armbruster, Anderson & Ostertag 1987; Flood & Lapp 1988; Ohlhausen & Roller 1988; Spyridakis & Standal 1987). It is therefore important that different text structures are explicitly taught to children (Raphael, Kirschner & Englert 1988).

Armbruster et al (1987) taught sixth grade children to use text structures, and it was found that their comprehension of such texts, as well as their ability to summarize them, had improved. Kozminsky & Graetz

(1986) had achieved similar gains, although second language speakers were less successful than first language speakers.

In conclusion, research has established the importance of the notion of text structure in improving reading comprehension. Text structure is achieved through the use of several linguistic resources such as the use of signals and visual material and the explicit statement of main ideas. These aspects will now be discussed in turn to establish how they could be analysed in a text.

> Signalling, or adding a word or statement that announces content or relationships in content before the actual content is encountered, attempts to emphasize and preview content relationships and help a reader identify superordinate content and make inference from it. In theory, signals should aid a reader in instantiating the appropriate schema, in forming a hierarchical framework in which to store textual information, in deciding what information is important and in checking the correctness of his or her integration and storage of information in memory (Spyridakis & Standal 1987:286).

Signals in the text thus emphasize or point out certain aspects or ideas in the text (Armbruster & Anderson 1988:48; Steinley 1987:117). Headings, subheadings, previews, overviews, summaries, the use of conjunctions and textual clues such as underlining, boldface and italics are all regarded as such signals (Armbruster & Anderson 1988; Spyridakis & Standal 1987; Steinley 1987; Williams 1985). Ausubel (1985) advocates the use of three kinds of overviews, or organisers, i.e. introductory overviews, advance organisers and comparative organisers.

The introductory overview, according to Ausubel, is an overview of the work to come, saying, for example, that two experiments will be done next. The advance organiser concentrates on the general abstract concepts the children have to learn, while the comparative organiser points out in what ways previously learned and related ideas are either basically similar to, or essentially different from, new ideas and information in the learning task. We suspect that advance organisers may put a stress on L2 readers' capabilities.

Williams (1985: Chapter 7) indicates in his manual for editors that predictive and reinforced headings and the use of overviews increase comprehension. He emphasizes that headings will only function as signals if they really predict the content which follows. Other research has also indicated that the reader can only make use of headings if the paragraphs under them are properly organised (Steinley 1987:117). This view has been supported by researchers who have conducted linguistic experiments on the subject. These experimental results indicate that readers comprehend text better when they attend to such signals in the text. It was also found that improvement was greatest when the text was complex and lengthy and the content was unfamiliar. This result indicates that signals can be used to help readers cope with the type of text they experience most difficulty with (Spyridakis & Standal 1987).

As these signals are part of text structure, which children do not possess innately but have to acquire, children have to be explicitly taught to make use of them. The fact that they might not yet possess the necessary knowledge to make use of signals, does not mean that they should not be included in textbooks. Rather, as all findings suggest that such signals may aid comprehension, it seems reasonable to insist on their inclusion (Spyridakis & Standal 1987:294). Especially authors of children's textbooks should make more use of such signals. Finger (1987) found on doing an analysis of six textbooks prescribed throughout Europe that textual signals were conspicuous by their absence. It is therefore important that textbook authors are informed of the importance of textual signals.

The use of main ideas to represent the structure of the text is a second aspect to consider in defining a text structure (Lanham 1989). Baumann (1981, 1983, 1984, 1986) has researched the effect the explicit statement of main ideas in paragraphs and texts has on reading comprehension. He regards the recognition of main ideas as important. The reader is faced with too much text to be able to recall everything. He therefore has to be able to discriminate important from less important ideas so that he can use his memory effectively to retain only the important ideas from a text (Baumann 1984:94).

The main idea of a passage is not the same as the topic, but is the most general point the writer makes about his topic. For example, should the topic be *Dogs,* one main idea could be: *There are many kinds of dogs, and each has a set of unique characteristics* (Duffelmeyer & Duffelmeyer 1987:163).

The effect of main idea comprehension on overall comprehension of a text has been researched in detail by Baumann (1981, 1983, 1986). His reports indicate the following:

a Comprehension of text is improved when the reader is cued to attend to main ideas.
b The comprehension of main ideas is enhanced when they are made salient through use of underlining or boldface.
c Main idea comprehension is also improved when they are explicitly stated in the text.

On inspecting content textbooks, Baumann also found that students commonly encounter text in which the text structure makes it difficult to determine the author's topic, purpose, or questions from the headings, title and main idea sentences (if any were used) (Baumann 1986:3). This could be ascribed to a lack of organization of content in such a way that one proposition meaningfully follows from the previous one. When the meanings of new concepts or propositions are thus clearly presented, possible conflicts in meanings are resolved and new integration with existing knowledge is facilitated. This type of 'logical' ordering has been noted to affect the ease or difficulty with which a book can be read (Ausubel 1985; Williams 1985:59-64).

The third and last aspect determining text structure which will be considered is the use of visual material and its integration with the text.

It has been hypothesised (Moore & Skinner 1985:47) that illustrations can help to integrate material presented and to make inferences from a text, thereby improving comprehension of such text. Children when asked about pictures have answered that they help them to understand the text better. One child, after having paged through a book without reading its text, declared it to be interesting. When asked how he could know that without reading the book itself, he answered:

> "I know I haven't read it but you see I'm not very good at reading words so I always read the pictures first, then I know if the story's going to be good" (Dedicott 1987:59).

Research has, for some time, been divided on the effect of visuals on text comprehension. Results of experiments which were conducted in order to determine whether illustrations, graphs etc. helped or hindered comprehension seemed to be inconclusive. Pictures were found to increase comprehension of abstract text, but not of concrete text (Moore & Skinner 1985). Williams (1985:64-5) declares that tabulation is more readable than prose, and that readers read both artwork and prose, but Moore and Skinner (1985:46) found that visual material did not improve the comprehension of adult learners unless they were specifically cued to attend to it.

More recent research suggests that pictures, graphs and tables could contribute to better comprehension of a text if readers are taught to attend to such visual material (Levie & Lentz n.d.; Reynolds & Baker 1987). It has also been hypothesised that pictures help young children to develop language and thought, and that they help to fill in gaps in background knowledge, thereby making reading more effective (Dedicott 1987).

Reynolds and Baker (1987:163-4) propose the theory of selective attention to explain the apparently indeterminate research results on this issue. They suggest the following three-step model of how selective attention might affect prose processing:

a Text elements, visual material included, are initially processed at some minimal level and graded for importance.
b Extra attention is devoted to elements in proportion to their importance.
c Because of the attention, or a process supported by the attention, important elements are learned better than other elements.

The key issue is how the readers decide what is important. Reynolds and Baker suggest that this depends on the three variables of the task given for reading, the structure of the text and the extent of the reader's knowledge of and interest in the subject. Should the reader be cued to look at the pictures, they will be regarded as important. If the structure of the text is accessible, it will be afforded important status, and if the reader possesses an extensive knowledge about the topic, he can easily determine the important ideas in the text.

On the basis of this theory, Reynolds and Baker make the following predictions:

a Visual material presented alone will have more impact on comprehension than does the text alone, because the attention is more specified.
b When both text and adjunct visuals are presented, comprehension is frequently no better with text alone and frequently not as good as with visuals alone. It is proposed that the reader will constrain himself to the most familiar medium, i.e. text, and not rate the visuals as important. This would be the same as not having illustrations at all, and comprehension results are therefore comparable. When attending to the text alone, attention has to be distributed over the whole text. When attending to illustrations alone, however, attention can focus more specifically on one illustration. This explains why results for comprehension of illustrations alone are frequently better.

It follows from this argument that optimal comprehension of a text may be achieved by using both text and visual material, and focussing attention on both. Children will therefore have to be taught explicitly to attend to pictures, graphs and tables in their text, as they do not seem to do this naturally (Levie & Lentz n.d.; Reynolds & Baker 1987:164; Steinley 1987:118). Referring the reader explictly to the picture will remind the reader to use the visual materials provided.

In summary, the text structure elements, i.e. textual signals, main ideas and visual material have all been shown to have a propitious effect on reading comprehension. These aspects should therefore be used to analyse the coherence of any text, as the manner in which they are used can either aid or impede a reader's comprehension of that text.

The following aspects will be looked at when analysing text in this study:

a Do headings predict the following content?
b Is the content of the heading reinforced in the text immediately following?
c Is the content of a section organized in such a way that propositions follow from the previous ones?
d Is an overview of the chapter or section of it provided in comprehensible language?
e Do paragraphs have explicitly stated, salient, main idea formulations?
f Are readers reminded to use visual material to comprehend the text better?

2.3.2 Cohesion

Research on cohesion has been spearheaded by Halliday and Hasan, whose seminal work Cohesion in English was published in 1976. Williams

(1985:44) defines cohesion in terms of strategies which integrate loose sentences into a text by pointing out the relationships between those sentences. Chapman, currently doing research on the educational significance of cohesion, lets the emphasis fall on the linking of items not accounted for by syntactic analysis, through their interdependence on one another for their interpretation (1986:7). This implies the cohesive concept of presupposition - a basic tenet of Halliday and Hasan's cohesion theory. Presupposition entails that an element functions cohesively if and when the referential element can only be interpreted by making reference to another element - the referential item then presupposes the existence of an antecedent which is present either in the text or in the real world (Chapman 1986:9).

Why should it be important to produce cohesive text when writing textbooks for children? Research suggests that comprehension of any given text depends heavily on the reader's ability to process the relationships between elements, relationships which are 'pointed out' through the use of cohesive elements (Riley 1986:577; Chapman 1986:9; Smith and Elkins 1984:156; Irwin 1980:331; Wishart 1987:40). If a text does not signal the relationships which exist between the elements, the reader must make his own inferences to support the missing links. This leads to increased processing demands and comprehension difficulties (Irwin 1980:325). Mature readers are known to supply this missing information (Skelton and Pindi 1987:127-8), but it has not yet been established whether immature and L2 readers do.

Halliday and Hasan (1976) divided cohesive elements into two categories, i.e. grammatical and lexical cohesive devices. Grammatical devices include reference, substitution by proforms, ellipsis and the use of logical connectors, while lexical cohesion includes the use of reiteration, synonyms, hypernyms or superordinates, general words and collocation or word association. An element only functions cohesively if the antecedent occurs in the previous or following text. Should both the referential item and the antecedent occur in the same sentence, Halliday and Hasan regard its occurence not as cohesive, but as a function of the syntax of the language being used.

Since the proposal of this taxonomy in 1976, several developments have been published and debated. These developments address either specific cohesive elements or the definition and classification of the categories of cohesion as outlined by Halliday and Hasan. Firstly Chapman (1986) reports a redefinition by Halliday and Hasan of the cohesive elements. Substitution has subsumed ellipsis, and cohesive devices have been recategorised as one of two types, i.e. componential or organic cohesion. Componential cohesion is created through the semantic components of words, and organic cohesion by an indication that larger aspects of the context are linked in certain specified ways, e.g. through connectives or repetition of theme. Componential cohesion in this system can be manifested in three types of relationship, i.e. coreferential, coclassificational or co-extensional (Chapman 1986:8; Smith and Elkins 1984:5).

Secondly Chapman proposes three basic operations of cohesive ties, e.g. co-reference, manifested by the use of reference and ellipsis,

conjoining, manifested by the use of connectives, and co-extension, manifested by the occurence of lexical ties (1986:8).

The third development concerns the definition of anaphora. Halliday and Hasan (1976) define anaphora as a type of referential cohesion whereby a pronoun refers backwards to a referent which has previously been identified. Baumann, however, defines anaphora in a much broader sense as "linguistic devices which signal the coreferential identity or near identity, of two concepts; language relationships in which a word or phrase is used in place of another word or phrase which has been introduced previously" (1985:3). According to such a definition, an anaphoric element can be a pronoun, other noun substitutes such as *the former,* or verbal or clausal substitutes such as *did too.* Baumann's definition of anaphora thus subsumes the categories which Halliday and Hasan have called reference and substitution.

The fourth development, proposed by Ushie (1986), concerns only one cohesive element. Halliday and Hasan do not accept the indefinite article as a possible cohesive element, because its function is not to specify a person or entity mentioned but not specified before. Ushie argues that indefinite expressions do have textual and cohesive function when used for a person or entity which has been identified previously, e.g. (1986:430):

> In 1974 the American magazine Rolling Stone invited Jan Morris to write a series of travel articles. The fruits of that collaboration between a romantic traditionalist Welsh author and a lively and innovative American paper appear in Destinations.

According to Ushie indefinite expressions of the type illustrated above present the person or entity in question in a new light and from a different perspective due to the writer's interpretation and shift in point of view and therefore function cohesively in such contexts (1986:427).

None of the developments discussed fundamentally change the original conception of the basic cohesive elements, i.e. reference, substitution, ellipsis, and the use of connectives and lexical cohesion. For the purposes of this study, therefore, the 1976 Halliday and Hasan taxonomy of cohesion will be used. The coding scheme suggested by them will also be used to analyse the cohesive elements occurring in the texts of the schemes and textbooks.

The cohesive devices which will be analysed are as follows:

A Grammatical devices
- A.1 Reference
  - A.1.1 Personal reference
  - A.1.2 Demonstrative reference
  - A.1.3 Comparative reference
- A.2 Substitution
  - A.2.1 Nominal substitution
  - A.2.2 Verbal substitution
  - A.2.3 Clausal substitution

A.3 Ellipsis
- A.3.1 Nominal ellipsis
- A.3.2 Verbal ellipsis
- A.3.3 Clausal ellipsis

A.4 Conjunctions
- A.4.1 Additive
- A.4.2 Adversative
- A.4.3 Causal
- A.4.4 Temporal
- A.4.5 Other

B Lexical devices
- B.1 Same item reiteration
- B.2 Synonym
- B.3 Hypernym or superordinate
- B.4 General word
- B.5 Collocation

2.3.3. Speech Acts

One basic premise of speech act theory as proposed by Searle is that utterances, be they spoken or written, are not made in a vacuum, but are designed to perform specific functions (1975). Adegbija emphasises that the encoding and decoding of speech acts involves cognitive processes in which "the linguistic competence of the participants, their world knowledge, their psychological state, and their knowledge of socially and culturally relevant factors of the situation are accessed, activated and put to work in the process of inferring the meaning and the speech act function of utterances" (1987:43).

These statements can be summarized in two points which have direct bearing on the analysis of the speech acts used in a text:

a Every sentence performs a specific function.
b The reader has to be au fait with the culture surrounding the creation of a text to determine its function.

When analysing a text's speech act comprehensibility therefore, the analyst needs to have information of two kinds. In order to determine the complexity of the speech acts used in the text he needs to know what speech acts the author could possibly use. To match those speech acts used in a text with readers from a specific group, the analyst needs information about the extent of knowledge his target group possesses about the pragmatic system reflected in the text.

Should the reader not have the relevant socio-cultural knowledge to interpret a given speech act, the illocutionary meaning or force of that utterance may be misinterpreted.

The use of indirect speech acts, when the speaker intends to communicate more than he actually says, makes the task of the listener or reader

even more difficult. For example, a sentence in a science textbook such as *Can you count the leaves?* may be interpreted by a naive reader as a sincere question pertaining to his mathematical ability. In such a case his reaction to that speech act may be a simple affirmative answer, whereas the author initially intended it to have the illocutionary force of a directive, and to result in the reader actually counting the leaves. Thus there is a complex set of locutionary act and illocutionary force combinations which need to be acquired (Titone 1985:68). That these possible combinations be acquired is of importance if the reader needs to comprehend any utterance in a specific language and culture (Adegbija 1987).

The different speech acts which can be used have been classified by Searle as assertives, directives, commissives, expressives and declaratives (1969). They can be recognised by the psychological states they express. The psychological state expressed by assertives is belief, because the writer is writing something he believes to be the truth. The psychological state expressed by directives is want, because the writer is trying to make the reader do something. With a commissive, the writer is committing himself to a future course of action, e.g. making a promise, and the psychological state expressed with a commissive is intention. Expressive speech acts express personal feelings or emotions, which simultaneously constitute the psychological state of the writer. Lastly, declaratives bring about a correspondence between the propositional content and reality, e.g. "I resign".

Doing science entails finding out about the world around us. If an adult wants to guide a child through the process of finding out, he will issue directives to the child. These directives can take on different appearances, however. For example, he might tell the child to do something, or he might ask the child if she can or cannot do something, but he might also ask a real question to start the child thinking in a certain direction. In order to be able to analyse all these different possible speech acts, the following detailed classification of directives by Ervin-Tripp (reported in Wertsch 1979) can be used:

1 Need or desire statement, e.g. I need a match.
2 Imperative, e.g. Give me a match.
3 Imbedded imperative, e.g. Could you give me a match? (ability)
4 Permission directive, e.g. May I have a match?
5 Question directive, e.g. Do you have a match?
6 Hints, e.g. The matches are all gone.

This taxonomy of speech acts and directives will be used to analyse texts in this study.

2.3.4. Syntax

The questions why one should analyse the syntactic complexity of a text and how one should do it will be discussed in this section.

In discussing grammar, Leech et al state that the main function of a language is to communicate successfully with other people (Leech, Deuchar & Hoogenraad 1982). In order to achieve this successful communication, people hearing or reading language have to be able inter alia to decode the meaning of individual sentences. Should they be unable to do so, the speaker or writer fails in his attempt at communication. It is therefore important to know what the level of syntactic complexity of a sentence is if the analyst aims to determine the appropriacy of a text for a target group. The complexity of syntax can then be compared to the ability of the target group.

The relative syntactic complexity is important also because it has been hypothesised that complex syntax reflects complex thought patterns, and the analyst would need such information too in order to determine the appropriacy of the text for his target group (Cheong 1978:7).

Cheong assumes a significant correlation between the syntactic structures of texts and their content (1978:6). If this is so, a specific text type can be expected to have specific predominating syntactic structures. The type of structures used and their complexity are important aspects of text comprehension, and therefore important to analyse.

When determining how appropriate a text's syntax is for a target group, that group's knowledge of the language in which the text is written has to be kept in mind, but the complexity of corresponding structures in the mother-tongue (if the text language is not the mother-tongue) can also play an important role (Fisiak 1981).

The aspects of syntax which will be used in this study to analyse sentences have been taken from the reference grammar *A Comprehensive Grammar of the English Language* (Quirk, Greenbaum, Leech and Svartvik 1985). As a reference grammar it provides a comprehensive description of English and highlights the important aspects of its syntax (Greenbaum 1987:194). Many different theories about syntax have been proposed and debated. However, an eclectic approach to syntax is not a feasible possibility, because the different theories are based upon different assumptions about language. It was therefore decided to use Quirk et al as a basis for syntactic analysis.

The pedagogical grammar *Analysing sentences - an introduction to English syntax* (Burton-Roberts 1986) has been used for the analyses of sentences into tree diagrams. This was made possible by the fact that the theory behind Burton-Roberts' analyses is based on Quirk et al 1985).

One of the aspects of syntax analysed is grammatical linkage. This pertains to the grammatical functioning of connectives, their presence or absence in a sentence and the degree of embedding within a given sentence. This section could be regarded as a separate factor influencing reading comprehension. However, for the purposes of this study it was subsumed by the analysis of syntax.

Grammatical linkage has been identified as an important factor of syntactic complexity. According to Quirk et al a reader will always assume that there has to be a relationship between two adjacent sentences. In

the case of there being no overt connective signalling what that relationship is, the reader will tend to supply one which makes sense to him. Thus grammatical linkage can either be overtly signalled or only implied. A connection with an overt connective signalling the relationship between clauses is called a syndetic connection. Should the connective be absent, the connection is referred to as asyndetic. Both syndetic and asyndetic connection can be achieved through either coordination or subordination (Quirk et al (1985).

The literature seems divided on the importance of syndetic connectedness or the lack thereof. Pearson (1975:186) concludes at the end of his study that comprehension and recall was better for cued causal relationships (explicitly stated) than for uncued ones (not explicitly stated). Lanham, writing the ELT course Bridge, insists that making the logical relations between propositions explicit facilitates reading with comprehension and learning (Lanham 1989). McClure, Mason and Barnitz (reported in Geva & Ryan 1985:333) on the other hand, concluded after a study done in 1979 that, up to Grade 9, children ignored clues to sentence order given by conjunctions in a paragraph building test.

This study, however, will hold the assumption that explicitly stated relations are easier to process than relations not explicitly stated.

The categories of syntax which will be incorporated in the analysis of the syntactic complexity of texts in this study are the following:

a phrases
b finite clauses
c non-finite clauses
d syndetic connections
e asyndetic connections
f discourse markers
g sentence constituents e.g. subject, object, complement
h passives
i incomplete sentences
j apposition

2.3.5. Vocabulary

The vocabulary of textbooks can roughly be divided into two categories, terminology and non-technical terms. The study of any academic discipline necessitates using terminology. What is the nature of these technical terms? A technical term is " a word or phrase which, when used in the context of a particular academic discipline, carries a single specific meaning" (Evans n.d:585). These words can be specifically constructed or taken from another language. They can also be derived from existing words through the use of affixes, or an existing word may take on a specific meaning in a particular discipline. The use of such terminology may create comprehension problems if the reader does not know the discipline-specific meaning of those words.

The comprehension of non-technical vocabulary, however, may also create reading comprehension difficulties, because the reader not only has to know the meaning of the terminology used in the text, he has to know the meaning of all the vocabulary used in order to make sense of that text.

According to reading research, vocabulary learning, especially in the second language, seldom happens incidentally. Therefore direct vocabulary instruction should be a primary component in second language and content instruction (Florez & Hadaway 1987; Hague 1987:218-220).

Jenkins and Dixon (Hague 1987:218; Simpson 1987:20-21) posit three levels of understanding the meaning of words or concepts, i.e. the levels of verbal association, partial concept knowledge and full concept knowledge. At the level of verbal association a person can only assign a label to a known concept, while the other two levels presume a capacity to recognise and use a word in only one or in different contexts.

Stahl proposes a similar theory of lexical understanding, which involves the three levels of association, comprehension and integration. According to this theory lexical knowledge develops from knowing a word in a single context, through having access to multiple contexts in which the item can be used, to being able to manipulate the item to produce original contexts for it (Hague 1987:219).

This meaning that has to be acquired is twofold in nature - a word has a denotative and a connotative meaning. The denotative meaning is embodied in its definition. This is usually the meaning learnt first. The connotative meaning refers to the framework of association and implications of the word. This meaning is usually the one learnt only when the word is used in different cultural contexts (Sutton 1980:50).

This word knowledge exists on the different levels of semantic accessibility discussed above. On the one hand, an unknown word may disrupt the comprehension process, while highly accessible words, on the other hand, allow comprehension to be reached. Because of the interrelatedness of words, the degree of comprehension achieved hinges on the quality of the connection among concepts in a reader's semantic memory (Hague 1987:218). The connected nature of word meanings also implies that such a meaning is not static. It can vary subtly from person to person and can grow and change with time (Sutton 1980:50,54).

According to Campbell (1987:132), lexis is the aspect of reading texts most regularly identified by readers as difficult. A wide background knowledge of the topic under discussion can make the reading of a text less traumatic for the pupil. However, if the pupil is confronted with a new topic, couched in a language he has not yet acquired adequately, vocabulary can be a profound obstacle to comprehension (Davey 1987; Flood & Lapp 1988; Ryder & Hughes 1985).

Furthermore Saville-Troike found a strong correlation between vocabulary knowledge and academic achievement through medium of a second language. This study highlights vocabulary as an important factor affecting reading comprehension (1984:216-7). Recently researchers have been able to

show that an improvement in reading comprehension can be directly attributed to an increase in vocabulary (Hague 1987:218).

The following exposition of theories about the relationship between vocabulary and reading comprehension have been taken from Hague 1987.

Anderson and Freebody advance three theories about this relationship between vocabulary and reading comprehension:

a The aptitude hypothesis posits that intelligent people are better readers because they have a superior intellect.

b The knowledge hypothesis proposes that vocabulary knowledge reflects the extent of a person's general knowledge, which then adversely or propitiously affects reading comprehension.

c The instrumentalist hypothesis posits that improvement in reading comprehension directly correlates with the number of vocabulary items a person knows, because the more you know, the more is likely to be understood.

Mezinsky later proposed a fourth hypothesis:

d The access hypothesis posits that words are useless to the reader unless their various meanings are easily accessible, even to the point of automaticity.

Kameenui thereafter posited a fifth hypothesis:

e The last theory subsumes the previous four and is called the instructional design hypothesis.

Both second language teaching schemes and content subject textbooks have an implicit theory of vocabulary instruction, based on the author's belief about the relation between vocabulary knowledge and reading comprehension. The different manifestations of some of the theories discussed above will now be examined:

a The *instrumentalist* hypothesis resulted in the learning of long lists of words, or the use of a dictionary to learn words from, because it was posited that the more vocabulary a child knows the better will be his reading comprehension. This type of approach was used in most schools for many years in the past.

b The *knowledge* theorists teach vocabulary in context, which simultaneously implies concept development. Children are explicitly taught how to make use of contextual clues, because it cannot be assumed that pupils can effectively utilize the clues to determine the meaning of words. Semantic maps, comparison and contrast, and discussion are used to teach children to infer the meanings of words in context.

c The *access* hypothesis promotes multiple repetitions of vocabulary items in varying contexts. To these theorists one or two exposures to

the definition of the word are as ineffective as no teaching at all (Hague 1987:219; Davey 1987:179).

Currently a mixture of the instrumentalist and access theories is promulgated in most schools. Vocabulary is taught a number of times in different contexts so that the necessary interrelationships of meanings and concepts are made clear and the meaning of the word is reinforced and expanded. This type of instruction is regarded as the most suitable approach for second language classrooms also (Hague 1987:221).

Previous analyses of the vocabulary used in texts have looked at the number of unfamiliar words used in an established number of sentences. Unfamiliar vocabulary was examined as a variable of readability as early as 900 AD (cf. section 2.1). Several textual analysis models use unfamiliar vocabulary as a measure of text difficulty for a specific target group (cf. section 2.2).

The question of the extent to which a target group will understand the vocabulary used in a given text is an important one. (The relationship between vocabulary knowledge and reading comprehension has been discussed in detail). However, the number of new vocabulary items in a text is not the sole important aspect of lexis in a text. Other aspects of vocabulary usage which will also have to be analysed are how frequently new vocabulary items are introduced in a text and how these new items are introduced and explained (Williams 1985:vi).

These questions become more important in the light of Macdonald's (1988) estimate that the jump in English vocabulary learnt up to the end of Std 2 compared to the vocabulary required to cope with the Std 3 textbooks written in English might be as much as 1000%. The purported jump should alert us to a massive problem on the lexis level alone (cf. for example the comment by Durojaiye (1974) in 2.2 above).

Various models for textual analysis have been proposed in the literature. It has been shown why they could not be used in this study, and an alternative model has been proposed. This model has been discussed in detail in this chapter. It will be used to analyse textbook passages and ELT schemes. Chapter 3 describes the methods used in these analyses, the results of which are reported and discussed in Chapters 4 and 5.

CHAPTER 3

METHOD

When using an eclectic model, different methods of analysis may be used for the differing theories one has brought together. This chapter first explains the study design and how the ELT schemes and science textbooks used in it were chosen. Descriptions of the different methods of analysis follow. These descriptions have been divided into the two main sections of intrasentential and cross-sentential analysis with their respective sub-sections as set out in Chapter 2.

3.1. DESIGN OF THE STUDY

The design of this study is schematically conceptualised in table 3.1. This chapter will describe the methods used to analyse the English language teaching (ELT) schemes and Std 3 General Science textbooks which were chosen for this purpose. The reasons for their being chosen are set out in sections 3.2 and 3.3.

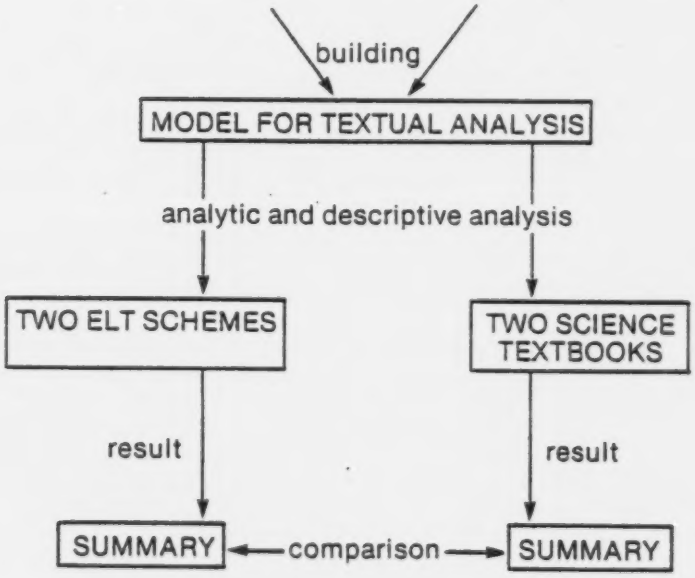

Figure 3.1: Study design

A model for textual analysis, as described in detail in Chapter 2, was developed. Then the two ELT schemes and sections from the two textbooks were successively analysed, using the developed model as instrument of analysis. These analyses, the methods of which are described in detail in this chapter, were analytic and descriptive, and resulted in summaries of the linguistic structures and items taught in the schemes from Grade 2 to the end of Std 2 and those used in the analysed sections of the two textbooks. They are analytic in the sense that, for example, tree diagrams of sentences are drawn and cohesive ties are analysed according to an established theory, while the coherence is more qualitatively described instead of quantitatively analysed. Aspects of these summaries are compared to each other to establish the nature and extent of the existing disparity between what communicative skills **could**, under ideal circumstances, be expected from the pupils by the end of Std 2 and what actually is expected from them in the two Std 3 science books.

3.2. CHOOSING THE LANGUAGE SCHEMES

Two English language teaching schemes were chosen for this study to serve as profile of ideal competence of any child who was taught through these schemes over the three years from Grade 2 to the end of Std 2. The language taught in these schemes is taken to represent a possible English competence of a child at the beginning of his fifth year of school, i.e. at the beginning of Std 3.

The two schemes eventually chosen were the Macmillan Primary English Project (MAPEP) and Longman's New Day-By-Day English Course. MAPEP was written by M. Rogers and A. Murray-Robertson and published by Macmillan Boleswa Publishers (Pty) Ltd. (No date of publication is given.) The Day-By-Day scheme was written by H. Harman, D. Dallas, K.B. Hartshorne, J. Hemming and W.T. Miller and published by Maskew-Miller Longman in 1983. They were chosen because they are both widely used in schools under the administration of the Bophuthatswana Education Department.

3.3. CHOOSING THE SCIENCE TEXTBOOKS

All seven Std 3 General Science textbooks on the recommended list of the Department of Education and Training were originally used for this study. After an initial perusal of these textbooks it was hypothesised that some of these textbooks were better suited to black Std 3 users than others were. The Threshold Project had at the time completed and published a module on plants for an experiment in Bophuthatswana schools. It was then decided to test the comprehensibility of each of the seven textbooks and the Threshold texts relative to each other (Van Rooyen 1988). I wrote a text on air compression for this test. The purpose of the test was to reduce the number of textbooks to be analysed.

The idea was to use only two textbooks which could be analysed comprehensively rather than analyse seven textbooks superficially.

From each of the seven textbooks as well as from the Threshold material, two passages were taken for a c-test (Klein-Braley 1985; Raatz & Klein-Braley 1981), i.e. the section on air compression and the section on the development of the bean seed into a seedling. The whole section from the textbook was given to the child in order to contextualise the mutilated passage. In each section 20 words had to be completed, thus each child had to finish 40 words in all.

164 children (2 classes) from two schools in Temba, Bophuthatswana, were tested by the Threshold team. Each class was divided into 8 groups. The children were taught what the c-test format expected of them before they started the test.

The results for both schools and both passages compounded were as follows:

MATERIAL	AVERAGE MARK OUT OF 40	n
Threshold	26,76	21
Hamlyn	24,95	21
Fourie	23,90	20
Fox	23,00	19
Thomas	20,21	19
Van Dyk	19,13	22
Metrowich	16,60	21
Magi	16,57	21

Table 3.1: Results for Threshold comprehensibility test

Fourie, Kaske and Hiesterman is prescribed and used in the schools we tested, which could have inflated the scores for these passages somewhat.

The separate results for each passage revealed that the comprehensibility level of one book need not necessarily be constant throughout that book. Therefore it was decided that more than one passage from each book would have to be analysed in order to make a statement about comprehensibility level. It was finally decided to analyse two passages of 100 sentences each from two of the books intrasententially, and to use two complete topics for the cross-sentential analysis.

Because the Threshold text was never intended to be part of the disparity analysis, it was not used. The results for Fourie et al could not be trusted fully, (since this was the subjects' textbook), and had therefore also to be discarded as a possible textbook to analyse. The final choice fell upon the two textbooks which ranked most comprehensible in the list remaining, i.e. Fox, H.E., Horn, L., Opie, F.W.J., Pienaar, H.N., Vorster, P.W. & Walters, S.W. Understanding Science 3. Maskew

Miller: Cape Town, 1982 (henceforth referred to as Fox), and Hamlyn, D.R., Rogan, E. & Rogan, J.M. Science - an investigation Std 3. McGraw-Hill Book Company: Johannesburg, 1982 (henceforth referred to as Hamlyn). Photocopies of the 400 sentences as they occur in the textbooks can be found in Appendix 2.

This decision was made because it seemed most fair to establish the disparities between end-of-Std 2 competence and those textbooks which seemed to be relatively successful in communicating their content. I would like to emphasize that this study is not an attempt to negatively criticise existing textbooks, but an attempt to find a solution for a serious comprehension problem (cf. Chapter 1).

It is interesting that, although these two chosen textbooks were comparatively comprehensible, they are very dissimilar in language used, approach, and presentation. Although both lay claim to being specially written or adapted to suit children in DET schools, they do not look the same.

The developed model for textual analysis (See Chapter 2 and Fig. 2.1 for detailed discussion and schematic representation) was used to analyse the schemes and the textbooks, so that these analyses could be compared and the disparity between lower primary text up to the end of Std 2 and the text in Std 3 content subjects made clear.

3.4. INTRASENTENTIAL ANALYSIS

3.4.1. Speech Acts

A. THE SCHEMES

To establish what types of speech acts the children were taught in the schemes, the teacher manuals, pupil books and readers were analysed for instances of explicit teaching of the illocutionary force of locutionary acts and the different locutionary act-illocutionary force combinations used.

B. THE TEXTBOOKS

The four chosen 100 sentence passages from the two textbooks Fox and Hamlyn were analysed. Locutionary act and corresponding illocutionary force were noted for each of the 400 sentences.

C. THE COMPARISON

The different combinations of locutionary act and illocutionary force taught in each of the schemes were compared to those found in the textbooks. This comparison illuminates the extent of the disparity between the schemes and the textbooks on the intrasentential level of speech act interpretation. Results of this comparison are reported on and discussed in Chapter 4.

3.4.2. Syntax

A. THE SCHEMES

The schemes were analysed by making a list of all the grammatical structures, such as embedded clauses and Wh-questions and elements, such as subordinating conjunctions, discourse markers and Wh-words, explicitly taught to the children, as well as those which occur in the reading texts only. The objectives stated in the schemes of work, as to what structures and/or elements would be taught in a lesson and the classroom language indicated in the teacher's manual were used to determine which structures and elements were explicitly taught to the children. Those structures and elements only used in the reading texts were kept separate from those explicitly taught (cf. section 4.2.1).

B. THE TEXTBOOKS

Two passages of 100 sentences were taken from each book and analysed intrasententially. The two passages decided on were the first hundred sentences of the section on plant reproduction and the first hundred sentences of the section on air compression. Thus both a biology passage which deals with concrete, recognisable content and a physical science passage covering a more abstract concept which was strange to the children were used.

The Hamlyn text on air compression is not 100 sentences long, but only 67 sentences. This text is followed by a glossary explaining new concepts and vocabulary. To make up the total of 100 sentences, the first 33 sentences of the glossary were also used, with interesting results (cf. section 4.2.3).

For each of the 400 sentences a tree diagram was drawn. The information contained in these diagrams was condensed into a list for each passage of the grammatical structures and elements used in that passage. This list contains the structures and elements used and the sentences they occur in. The frequency with which a specific structure or element is used can also be read from this list (cf. section 4.2.3).

C. THE COMPARISON

The list of structures and elements explicitly taught by and found in the texts of the schemes were compared with the list of structures and elements found in each of the four passages. The comparison was done in four stages. The first two stages were:

(a) Compare the list of structures used and taught in the ELT scheme to those used in the science textbook and write down structures not explicitly taught yet used in the textbook passage, and the sentence in which each one occurs.

(b) Compare the list of lexical elements used and taught in the scheme to those used in the textbook and write down elements not explicitly taught yet used in the textbook passage and the sentence in which each one occurs.

These comparisons result in a list of sentences in which grammatical structures and elements occur which the children have not learnt while doing their English course from Grade 2 to Std 2. Each scheme represents the competence children in Std 3 might have. However, when confronted with this list of sentences they might have comprehension problems because they contain structures and elements which they have never been taught before. These first two stages represent the purely analytical or idealised part of the four-stage comparison.

The third stage of comparison was:

(c) Compare the list of structures used only in the reading texts of the schemes with the list of structures used in the passage and write down the sentences in which these structures occur.

The results of this stage of the comparison will be rather more realistic than those of the purely analytical first and second stages. This increase in realism is brought about by the theoretical adjustment made, i.e. the inclusion of those syntactic structures used only in the readers. The fact that children might have learnt the structures, although they are only used in the readers and not explicitly taught, is taken into account.

It has to be kept in mind that this study assumes a situation in which learners learn what teachers teach, in other words it assumes a situation which might not really exist (Allwright 1984). In a language classrooom it is not as simple as knowing only and definitively what you have formally been taught. The real situation is more complex than that. The language classroom offers possibilities for both acquisition and learning of the target language. The child can acquire structures of the second language which the teacher or other models use, or which he hears or reads, but which have not been formally taught by the teacher. It has been found that learners might learn more from the topicalisation by themselves and other learners than from the topicalisation by the teacher, and that very poor students sometimes do not even learn from topicalisation by themselves, but learn most from topicalisation by other students (Slimani no date). In other words, the child does not

necessarily learn everything the teacher, scheme or textbook teaches him (Krashen 1981: Chapter 3). The combination of structures taught, learnt and acquired can be different for each child.

The fourth and last stage of comparison was:

(d) Add sentences with WH-questions to the comparison list as possible problem sentences. Wh-questions are taught by the schemes, consequently one would assume that all children can use and interpret them. However, results of a Threshold test indicate that this is not so.

While the last three stages of comparison analysed only the published materials, this stage of comparison represents the third level of analysis - the level which takes into account some practical experience of these children's English language competence.

Threshold fieldwork done in Bophuthatswana and Soshanguve near Pretoria revealed that the children had grave problems with comprehension of WH-words and WH-questions (Macdonald 1988).

A comprehension test was based on a Grade 2 Bridge to English story about a dog called *Bonzo*. The story was divided into parts and each of these parts was illustrated. The 15 questions were asked below each part where their answers could be found. One Std 3 class from each of four schools each was tested. Only one of these schools, Saron Primary, is a Phase 1 model school of the Primary Education Upgrading Project, while the other three are more average schools. As teachers from Phase 1 model schools of this project receive intensive training and guidance from the Project team, the children of such schools generally receive a higher standard of education and perform better on tests. Results for the four schools are:

SCHOOL	AVERAGE MARK OUT OF 15	s	n
Saron	13,38	2,59	18
Chaneng	11,11	5,00	44
A re Thabeng	9,60	3,47	10
Moremogolo	7,63	3,72	36

Table 3.2: Results for Threshold Wh-word test

These results, although even the lowest score seems quite good, are lower than one would expect as wh-questions figure prominently in both schemes. They are taught in Grade 2 and Std 1 and are used continually. One would therefore expect the children to obtain near-perfect scores. These results illustrate Allwright's and Krashen's points about teaching and learning made earlier (cf. section 3.4.2.C).

When trying to analyse the disparities between English as a subject up to the end of Std 2 and English across the curriculum in Std 3, one is forced to acknowledge that this is virtually impossible in real terms. One would have to establish exactly what the average competence of the children is for each aspect of the language. Comparing all the language taught up to the end of Std 2 with a sample of the language demands of Std 3 then, is a considered solution to this problem.

In an attempt to solve the idealisation problem of this study, I analysed the intrasentential aspects in four stages and on three levels. Firstly, the intrasentential aspects were analysed on a level where children know everything they have been taught and do not understand what they have not been taught. Secondly, they were analysed on a rather more realistic level where children understand the structures they have been taught, but also understand some structures they have not been taught, and where all comprehension problems are not equally serious. Thirdly, the intrasentential aspects were analysed on an even more realistic level, where practical experience on the Threshold Project of the children's English competence is taken into account.

The first two stages of comparison (a and b above) deal with the first **purely analytical or idealised** level. The third stage of comparison deals with the second level of analysis; the rather more realistic level in which those structures used only in the reading texts are also taken into account. Sentences with structures which are used only in the reading texts will be called 'possible problem sentences'. Even though the children have seen these structures in their texts before, they have not been taught them explicitly. Grammatical structures which have been introduced once but have not been repeatedly revised throughout the years, also fall into the 'possible problem' category. Realistically seen, these structures might pose a comprehension problem to the child reading them. The figures for this comparison, are therefore more realistic than those for the ideal circumstances mentioned above.

Adding **practical experience** to realistic expectations and analytic results, the statistics for the fourth stage of comparison attempt an accurate projection of the real-life grammatical comprehension problems a child might encounter when reading a specific passage.

The result of these comparisons are finally plotted onto a grid and the statistics for each passage which are compared to each scheme (see section 4.2.6) are read from this grid.

Statistics are arrived at by counting each sentence with a structure which has not been taught in the scheme as a serious comprehension problem. Should a sentence be marked with two or more possibly problematic structures, the sentence was also regarded as a serious comprehension problem.

3.4.3. Vocabulary

A. THE SCHEMES

Day-by-Day teacher manuals each contain a list of the vocabulary taught in the specific year. This vocabulary is divided into vocabulary for pupil's use and reading vocabulary. As this study concerns itself with ability, the reading vocabulary was also included in the analysis. Many of the vocabulary items are taught twice, in which cases the second occurrence of the word was deleted.

MAPEP does not include vocabulary lists in their teacher manuals. However, the scheme of work summaries given before each unit do contain vocabulary items taught for use by the pupils and those taught for pupil's understanding. These were used to compile a list representing the vocabulary taught in the MAPEP scheme.

Different forms of the same lexeme, e.g. *GIVE: gives, given, giving, gave* and plural forms of singular nouns were counted as occurrences of the same lexeme. In other words, only one instance of *give* was counted even though other forms of this lexeme were present. Plural forms were also not counted if the singular noun was present.

It must be understood that the vocabulary lists compiled for each scheme are not exhaustive lists containing all the vocabulary items to be found in the teacher manual, pupil's books and readers. This analysis therefore, is not a comprehensive one. Rather than resulting in definitive statements about the disparity of vocabulary taught and used, it provides an indication of the extent of the problem the children have to contend with.

Should a comprehensive analysis be attempted in the future, it should be kept in mind that Krashen's theory about teaching and learning is also relevant here. I suspect that too many language courses result in a list of vocabulary and little grammar, because vocabulary is learnt easily when compared to learning syntax.

B. THE TEXTBOOKS

The four textbook passages of 100 sentences each were used once more. A comprehensive list of all vocabulary items used in each passage, four lists in all, was compiled. Repetitions of the same words were deleted, but different forms of the same lexeme were kept intact.

C. THE COMPARISON

The vocabulary lists for each textbook passage were compared in turn with the lists of vocabulary items taught in Day-by-Day and MAPEP respectively. The different forms of lexemes used in the textbook passages were regarded as taught in the scheme if either one of the forms or the lexeme itself occurred in the scheme's vocabulary list. The disparity

is expressed in two ways. Firstly as a statistic - the percentage of words used in the textbook passage which have not been taught in the scheme. Secondly the highest and lowest disparity found is presented visually - the vocabulary items which occur on the first two pages of these passages which have not been taught in the scheme are blanked out in order to give one an idea (albeit a crude one) of what the children have to contend with (see Appendix 3).

Not only are the textbooks compared to the schemes, but the schemes and textbooks are also compared to one another. The implications of these comparisons are discussed in Chapter 4. The statistical results are also presented in Chapter 4, but the visual demonstration pages can be found in Appendix 3.

3.4.4. The Computer Program

To analyse a text as comprehensively as is proposed in this study, is very time-consuming. It was thought that the use of a computer might simplify the analysis, at the same time making it more cost-effective.

The Computer Centre of the HSRC was consequently asked to draw up a computer coding scheme and to write a program to analyse the 700 textbook sentences and the language schemes. This computer program cannot grammatically analyse a sentence, but tree diagrams of the sentences can be coded so that the program can answer the following questions:

1 What is the maximum number of imbedded sentences found?
2 What can S/SS consist of?
3 What can an NP consist of? What do the next levels contain?
4 What can all the other categories consist of? (same as 3)
5 How many times does a given category or combination occur?
6 How many times do empty NPs or AUXs occur?
7 What is the frequency of simple, compound or complex sentences?
8 What combinations of functions (S,V,O,C,A) occur and what is the frequency of occurrence?
9 What combinations of speech acts and intended pragmatic force occur and what is the frequency of occurrence?
10 What are the possible combinations and frequencies of co-ordinated, subordinated, syndetic and asyndetic grammatical linkage?
11 Which constituents are being linked in these sentences?

I will use the sentence *Put one maize grain and most of the bean seeds in separate jars* to illustrate the process. First a tree diagram of the sentence is drawn.

The sentence

Put one maize grain and most of the bean seeds in separate jars.

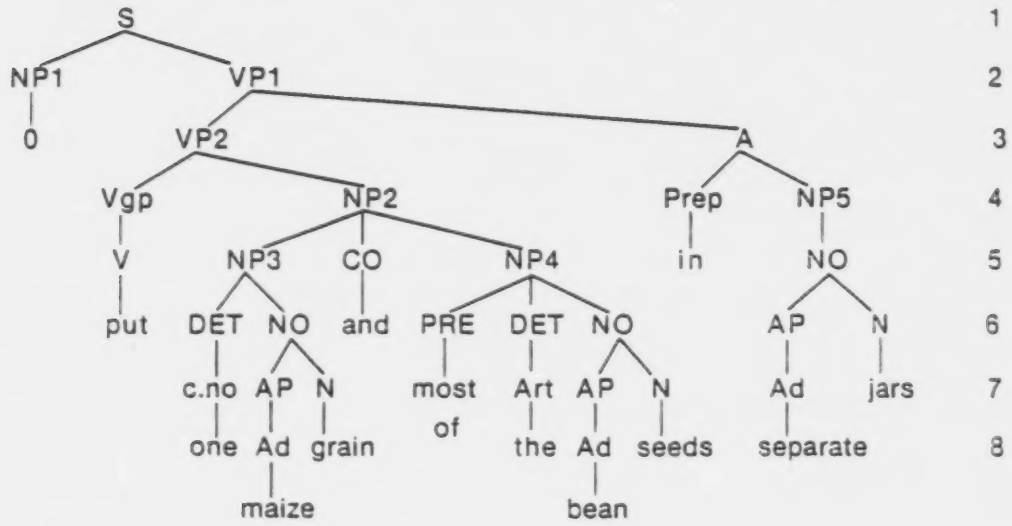

Figure 3.2: Example tree diagram

Secondly this tree diagram is coded and fed into the computer. The first digit refers to the vertical level of the constituent in the diagram. The last digit indicates which NP or VP of the three or four in the sentence is being referred to. For example, 5NP3 refers to the third NP from the left, situated on the fifth vertical level. The coding for the example sentence is given below to illustrate the process.

1S1 2NP1 X/1S1 2VP1 3VP2 4Vgp 5V/1S1 2VP1 3VP2 4NP2 5NP3 6D 7CNO/1S1 2VP1 3VP2 4NP2 5NP3 6NO 7AP 8A/1S1 2VP1 3VP2 4NP2 5NP3 6NO 7N/1S1 2VP1 3VP2 4NP2 5CO/1S1 2VP1 3VP2 4NP2 5NP4 6PRE/1S1 2VP1 3VP2 4NP2 5NP4 6D 7Art/1S1 2VP1 3VP2 4NP2 5NP4 6NO 7AP 8A/1S1 2VP1 3VP2 4NP2 5NP4 6NO 7N/1S1 2VP1 3A 4Prep/1S1 2VP1 3A 4NP5 5NO 6AP 7A/1S1 2VP1 3A 4NP5 6NO 7N/

The computer result of this sentence would be the following:

NP consists of: X (empty) (X = S-bar)
NO (nominal)
D NO (determiner + nominal)
PRE D NO (predeterminer + determiner + nominal)
NP CO NP (noun phrases coordinated)

VP consists of: VP A (verb phrase + adverbial)
Vgp NP (verb group + noun phrase)

A trial run was done on 100 sentences from one of the textbooks. The computer results for this can be found in Appendix 4.

The original idea was to obtain similar quantitative data for both the textbooks and the schemes, so that comparisons could then be made. However, the schemes were not analysable in this way. The schemes do not consist of running text the sentences of which can be analysed one by one. A scheme expounds the linguistic structures it teaches in its program of work. Example sentences of teacher and pupil talk can be found in the teacher manual where the lessons are discussed. The stories which the children have to read do consist of running text, but should one only analyse, say, the last 100 sentences of Std 2 reading passages, one would lose all the valuable data embodied in the scheme of work and discussion of the sentences in the teacher manual. MAPEP has the added problem that its reading passages are extremely short - ranging between 8 and 12 sentences each, which makes it less practical to analyse the last 100 sentences. Because they are unrelated passages, the results of the analysis of cohesion and coherence would be influenced, e.g. the scheme may teach more cohesion and coherence than is reflected in the reading passages. The same problem would be experienced with the analysis of syntax and vocabulary.

The analysis of the schemes resulted in a more disjunctive summary of the structures taught, which did not lend itself easily to the computer analysis. As a result, it was decided not to use this program, but to analyse both the textbooks and the schemes in a more qualitative manner.

A second reason for dropping the computer scheme, was the time-consuming task of coding each tree diagram onto a computer coding scheme. Information about this program, however, is still available at the HSRC's computer centre.

Anyone wanting to use this, would have to keep in mind that the program results in quantitative output. They would probably also need administrative help with coding. The example sentence *Put one maize grain and most of the bean seeds in separate jars* illustrated the complex coding which needs to be done. As the coding has to be meticulously done, it would be extremely time-consuming.

I should also like to emphasise the inevitable loss of information one sustains when linguistic analysis is done on a basis of phrase structure rules only. The computer program can indicate what branches a specific tree structure node has, but it does not indicate whether that specific node acts as a relative clause or a non-finite complement of that node. The successful use of this program thus depends on the purpose which it is put to.

3.5. CROSS-SENTENTIAL ANALYSIS

3.5.1. Cohesion

Halliday and Hasan's seminal publication (1976) was used to analyse cohesion in the textbooks and the language schemes. The coding scheme suggested by them was used as a basis for the analysis. However, three areas of possible shortcoming were found, i.e.

a In their sample analyses Halliday and Hasan do not use collocation to its full potential. In the analyses of the textbooks and the schemes, collocation may therefore have been used in a broader sense than Halliday and Hasan originally intended. The second sample analysis (Halliday & Hasan 1976:351), is a transcription of an informal interview. The interviewee describes the house she used to live in, using words such as *stone pillars, long stone staircase, verandah, folding doors, kitchen, living room,* but these instances are not recorded as collocating with the word *house*. In my opinion, this type of lexical field does contribute to the texture and should be analysed as collocatory. To illustrate the cohesive force of these collocations, one would create a different mental picture of both the speaker and the house had she used words like *narrow wooden staircase, studio* or *glass pillars*. However, this was thought necessary because the lexical fields used do contribute to the texture of texts. This is especially so when the text has been written for immature readers, as the author is then bound to use simpler syntax and depend more heavily on lexical cohesion.

b Halliday and Hasan do not regard the speech roles as cohesive agents. They argue that "Only the third person is inherently cohesive, in that a third person form typically refers to a preceding item in the text. First and second person forms do not normally refer to the text at all; their referents are defined by the speech roles of speaker and hearer, and hence they are normally interpreted exophorically, by reference to the situation" (1976:48). However, in the children's stories found in the schemes, first and second person reference does not consistently refer to the character in the story and definitely does contribute to the cohesion of the text. For example, in one of the listening comprehension stories from MAPEP, the reporter Mr Mfundo travels to Durban to interview dockworkers, because he wants to write an article about their work for his magazine. The story takes the form of a dialogue between Mr Mfundo and a sailor. Both men use the first person pronoun 'I' to refer to themselves. This use of first person pronoun does, contrary to the statement of Halliday and Hasan, have endophoric reference to the characters in the text, and it is important for one's comprehension of the whole story to be able to trace these pronouns to their respective referents. For purposes of comparing the textbooks to the schemes this problem area is not relevant, as the textbooks do not use first and second person in the same sense. When 'you' is found in the textbooks, it invariably refers to the addressee, while

'we' invariably refers to addressee and writer. So although the analysis of the cohesion in the stories should strictly speaking have been expanded to include the speech roles as having referential cohesion or lexical cohesion, as for this study it would not have made a great difference, Halliday and Hasan's scheme was not altered.

c The relationship between text and illustration is also not provided for in Halliday's analysis. In text written for children, the trend has been towards more 'interactive text'. The authors not only include the addressee as if conversing with him (as explained in point b), but the illustrations are more explicitly and informally referred to and discussed, e.g. *Look at this picture. This boy is pumping more and more air into the tyre.* Where this type of reference was used, it was noted down as cataphoric demonstrative reference, referring forward to an illustration or something in it by way of a demonstrative such as *this* or *these*.

A. THE SCHEMES

The schemes were closely examined for the cohesive elements explicitly taught and used in classroom talk and the stories which the children read. Because Day-by-Day and MAPEP differ, the reading passages analysed had to be chosen in different ways.

Day-by-Day consists of a teacher manual, a pupil's book with language exercises and a reader for each year. The teacher manual was examined for instances where cohesion was taught as a means of making sense of a text and for instances of cohesion in the teacher talk examples which the children would hear in class or read in their language books. Added to this information, the last two stories from the Std 2 reader, 49 and 50 sentences respectively, were analysed according to the Halliday and Hasan coding scheme with the abovementioned alterations.

MAPEP, on the other hand, consists of a teacher manual and a pupil's book which includes language exercises as well as reading passages. These passages are extremely short, ranging between 8 and 12 sentences. The teacher manual includes lengthier stories (25 to 35 sentences), but these are for listening comprehension only, not for reading by the children on their own. From MAPEP, the same information was gleaned from the teacher manual as from Day-by-Day. Added to that, the last two stories for listening comprehension (55 sentences total) and the last 50 reading passage sentences from the pupil's book were analysed for cohesion.

In other words, for each scheme, as for each textbook, at least 100 sentences were analysed for cohesion.

These analyses were distilled into two types of tables. Table 5.1 to Table 5.4 contain the different cohesive items which are taught by the schemes or used in their readers. Table 5.5 to Table 5.7 contain data about the types of cohesive ties found and how frequently they are used. All these figures are given as percentages of the total number of occur-

rences. In other words, we have under the types of cohesive ties percentages of the total number of ties.

B. THE TEXTBOOKS

From the two passages on air compression and plant reproduction chosen from each textbook for analysis, the first 50 sentences were analysed for cohesive ties according to the coding scheme of Halliday and Hasan with the alterations mentioned above, i.e. a total of 100 sentences from each book. Halliday and Hasan mention a study conducted by C.C. Bowley as far back as 1962 which suggests that "the cohesive status of the paragraph might differ markedly from one writer to another ... but (might) remain fairly constant within one writer, or at least within one work" (1976:333). With this in mind two passages of 50 sentences each in Hamlyn were analysed. The results for these two analyses, the first 50 sentences of the air and plant passages already used for intrasentential analysis, agreed with Bowley's findings - the global pattern for the use of cohesive devices in the two passages of the same textbook was the same. Both passages used referential and lexical cohesion to a great extent, used no or few conjunctions and used no ellipsis or substitution. It was therefore deemed not necessary to analyse 2 x 100 sentences as 50 sentences proved to be adequate in establishing the pattern of cohesive elements used.

The information gleaned from the analysis of the two textbooks was added to the table given in Appendix 5 to portray the cohesion found in the two textbooks.

C. THE COMPARISON

The comparison of the cohesion found in the schemes and that found in the textbooks was done on two axes, i.e. the types of cohesion the children are taught/exposed to up to the end of Std 2 compared to the types of cohesion used in the textbooks; and the complexity of the cohesion, the percentage each category accounts for in the texts of the schemes compared to that in the textbooks.

A complex pattern of comparison and cross-comparison results - the two textbooks are compared to each other on two axes, as are the two language schemes, and each textbook passage is compared to each scheme, also on both axes. The results of these analyses are discussed in Chapter 5.

3.5.2. Coherence

A. THE SCHEMES

All texts belonging to the two language schemes were analysed for instances of explicit teaching of coherence aspects such as the structure of paragraphs, the use of headings and the function of illustrations. Similar notes were made about the coherence in the pupil's books and the

readers for each of the three school years. A summary of those coherence aspects taught and used was made so that they could be compared to those found in the textbooks. The coherence as it was found to occur will also be discussed for each scheme.

B. THE TEXTBOOKS

For the analysis of the coherence, two whole chapters from each book were analysed. Two 100 sentence passages from each book was regarded as sufficient for the analysis of intrasentential aspects and cohesion. Coherence, on the other hand, is a more global textual aspect. For example, one has to look at the headings of a whole chapter in order to evaluate its organisation. As a result the two entire chapters from each book on air and plant reproduction were analysed in terms of coherence.

The following questions pertaining to the coherence of a text are asked:

a Are the paragraphs well structured, i.e. is there one salient main idea, is there a topic sentence and where does it occur?
b Is the content of headings reinforced in the text immediately following it? In other words, are the words used in the heading used again and expanded upon?
c Are the headings predictive of the content following them?
d How is the content in the chapter organised? Is there a 'logical' progression of argument?
e Do sections have a repetitive structure, e.g. text, summary, questions? Do these repetitive headings cover the same type of text? For example, is a summary always an extraction of main points from the preceding text?

The results of these analyses are used to describe and evaluate the degree of coherence found in each of the four chapters.

C. THE COMPARISON

A fundamental difference in organisation and orientation exists between narrative and expository texts. Narratives are more personal, with a first or third person and agent orientation, while expository passages are more distant, with a content orientation manifested in the use of equative and descriptive clauses and no necessary personal reference. The structure of fiction depends on chronological linkage. Expository writing links ideas or concepts logically and is therefore more dependent on linguistic markers of text structure than narrative text. As a result, expository text usually has a more complex syntax and requires more information processing than narrative text.

The structure of a story is determined by a story grammar, which consists of rules dividing the structure into several recognisable sections or episodes. The story contains an event which brings about a reaction from a main character: "This reaction leads the character to formulate a goal, make an attempt to reach the goal, achieve an outcome, and arrive at an ending" (Lehr 1987:550). Scientific expository text, on the

other hand, can be divided into different discourse structures such as definition, evidence, examples, experiments, conclusions, etc. (Kent 1984; Perera 1986).

These differences make it impossible to directly compare the coherence of the reading passages in the schemes with the text found in the textbook. However, as coherence is an important aspect of any expository writing, and as the children are suddenly faced with many more expository texts in Std 3 than in any previous year, they should be taught the main coherence conventions and the implications they have for text comprehensibility.

Although a direct comparison between coherence aspects in narrative and expository text is not possible, the coherence aspects which the children are taught according to the analysis of coherence in the two language schemes are compared to those aspects used in the textbooks. Such a comparison will point out those aspects which the children should have been taught in order to derive the maximum benefit from their textbooks.

CHAPTER 4

INTRASENTENTIAL ANALYSIS: RESULTS AND DISCUSSION

4.1. SPEECH ACTS

Speech acts can be direct or indirect. A sentence performs a direct speech act if the locutionary act corresponds to the illocutionary force of that sentence. When the locutionary act and the illocutionary force of a sentence are not the same, that speech act is said to be indirect.

Sentences performing direct speech acts are hypothesised to be easier to interpret for a child of the target group than a sentence performing an indirect speech act, because the interpretation load of an indirect speech act should be heavier than that of a direct one.

The two language teaching schemes and the four textbook passages were analysed for locutionary act-illocutionary force combinations. Results will be presented and discussed in the following order:

4.1.1 Locutionary act-illocutionary force combinations in the schemes - results and discussion
4.1.2 Locutionary act-illocutionary force combinations in the textbook passages - results and discussion
4.1.3 The disparity

4.1.1. Locutionary act-illocutionary force combinations in the schemes

The Day-by-Day and MAPEP schemes use direct and indirect speech acts in similar fashion. The direct speech acts and the indirect speech act combinations used in the two schemes will therefore not be discussed separately.

Neither scheme teaches any locutionary act and its corresponding illocutionary force explicitly. However, both schemes used a variety of direct and indirect speech acts in their teacher manuals and reading passages. The speech acts which are used in the schemes are presented below:

Direct speech acts

Assertives
Directives
Commissives
Expressives

Indirect speech acts

Assertive with force of direct imperative
Question directive with force of direct imperative
Imbedded imperative directive with force of direct imperative
Need directive with force of direct imperative
Question directive with force of commissive
Assertive with force of commissive

4.1.2. Locutionary act and illocutionary force combinations in the textbooks

Each textbook shows a predominance of sentences with direct speech acts. These speech acts are mostly imperative directives and assertives, but question directives (real questions) and commissives are also used. The results of the analysis of the textbook passages are presented in Table 4.1. below.

TEXTBOOK	DIRECT SPEECH ACTS	INDIRECT SPEECH ACTS
Fox	assertives imperative directives question directives	Dq with force of Di A with force of Di A with force of C Dq with force of C
Hamlyn	assertives imperative directives question directives commissive	Dq with force of Di A with force of Di Dii with force of Di A with force of C Dq with force of C

Table 4.1: Speech acts in the textbook passages

LEGEND: A=assertive, Di=imperative directive, Dq=question directive, Dii=imbedded imperative directive, C=commissive.

Where the locutionary act does not correspond to the illocutionary force of a sentence, the illocutionary force is mostly imperative directive. All indirect speech acts which have the force of commissives are headings, hence analysed as having a commissive illocutionary force. However, most sentences constitute direct speech acts.

An interesting correlation was found between mean sentence length (MSL) and the occurrence of indirect speech acts (see Table 4.2).

TEXTBOOK	MSL	PERCENTAGE DIRECT SPEECH ACTS
Fox	10,11	94%
Hamlyn	7,45	78%

Table 4.2: MSL and locutionary acts

It was found that text with a low MSL, such as Hamlyn, has a higher occurrence of indirect speech acts, than a text with a high MSL, such as Fox, which has a lower occurrence of indirect speech acts. This might be because textbook writers strike a balance between the length of sentences and their interpretation load. For example, a text with short sentences may use indirect speech acts. Questions and assertives may often be meant as imperative directives, whereas a text with longer sentences may be more direct, signalling directives to be directives and assertives to be assertives etc. This would point to a principle that, if sentences are short and do not need much processing, one might add to the processing load by using indirect speech acts.

This correlation is possibly an indirect one, mediated by the orientation of the author of the text. The high occurrence of indirect speech acts in Hamlyn might then be due to the fact that it is activity based, while the low occurrence of indirect speech acts in Fox might be due to the fact that it is more expository oriented. Activity calls for directives, which can be given in a variety of ways, while expository prose consists mostly of assertives.

4.1.3. The disparity

When the locutionary act-illocutionary force combinations used in the schemes and those used in the textbook passages are compared, no disparity is to be found between them. Children who have done either the MAPEP or Day-by-Day language teaching schemes therefore should experience no problems in interpreting the illocutionary force of the sentences in the textbook passages which have been analysed. However, should the children not be adequately prepared to interpret the illocutionary force of headings, they may not interpret these locutionary acts correctly. This problem is discussed further in section 5.2.3.

4.2. SYNTAX

When analysing the intrasentential aspects of texts, each sentence is analysed as a freestanding unit on four dimensions, i.e. speech act,

grammatical linkage, syntax and vocabulary used in that unit. (Chapter 2 provides a detailed description of each of these dimensions.)

The two language teaching schemes, Day-by-Day and MAPEP, were analysed in these terms as were two 100 sentence passages from each of the two textbooks, Fox (1982) and Hamlyn (1982). The results from these analyses will be reported on and discussed in the following order:

4.2.1(a) Summaries of syntactic structures explicitly taught in the schemes and those found in the reading texts
4.2.1(b) Discussion of the schemes: how do they prepare children for expository text and textbooks?
4.2.2(a) Summaries of syntactic structures found in each of the 100 sentence passages taken from the two textbooks
4.2.2(b) Discussion of the textbooks: how do they relate to the linguistic competence the children should bring to Std 3?
4.2.3(a) Tables showing the results of the comparisons of the syntax taught in the schemes and that used in the textbook passages
4.2.3(b) Discussion of the disparities between scheme and textbook

4.2.1(a) Summaries of the structures found in the schemes

The syntactic structures found in the schemes have to be divided into those explicitly taught to the children and those found in the lessons or reading texts which are not explicitly taught but to which the children are nevertheless exposed if the scheme is properly used. The summaries of these structures are as follows:

Syntactic structures and elements explicitly taught in Day-by-Day

a All types of verbgroup except complex verbgroup (sentence with an object complement, e.g. They make the tips of the root *look fuzzy.)*
b Commands, statements and denials
c Wh-questions with the wh-words *why, how, what* (asking about subject), *what* (asking about object), *who, how much/many, where, whose, when*
d Yes/No questions with verb-fronting, auxiliary fronting and fronting of the dummy auxiliary DO
e Tenses: present, past and future indefinite tense and present continuous tense, present perfect tense (only: I have got)
f Relative clause with the relative pronoun *who,* e.g. I see a man *who is carrying a ladder*
g Coordinating phrases with *and* and *or*
h Coordinating sentences with *and, or* and *but*
i Passive sentences, e.g. *He is called John* and *The chair is made of metal*
j Modals *can, must* and *will*
k Non-finite verbgroup complement (group 1), e.g. I am trying *to catch a fish*
l Non-finite adverbial, e.g. I went to my desk *to get a book*

m Non-finite postmodifier of NP, e.g. I need something *to put my clothes in*
n Finite verbgroup complement, e.g. I think *(that) this is a girl*
o Finite adverbial, e.g. She got some soap *before she washed the dishes* The subordinating conjunctions *before, then* and *because* are taught
p Comparative clauses, e.g. *bigger than, as tall as*

Day-by-Day readers add the following structures and elements

q Discourse markers *now* and *and so*
r Subordinating conjunctions *so, as* and *until*
s Non-finite verbgroup complement (group 2), e.g. Thank you for asking *us to stay*
t Non-finite complement of preposition, e.g. Thank you for *asking us*
u Non-finite postmodifier of N, e.g. I see a picture of a man *riding a bicycle*
v Finite verbgroup complement, e.g. I know *where it was*

Structures and elements explicitly taught in MAPEP

a All types of verbgroup except complex verbgroup (sentence with an object complement, e.g. The council appointed him *chairman.)*
b Commands, statements and denials
c Wh-questions with the wh-words *why, what* (asking about subject), *what* (asking about object), *who, how much/many, where, whose, when, which, what else*
d Yes/No questions with verb-fronting, auxiliary fronting and fronting of the dummy auxiliary DO
e Tenses: present, past and future indefinite tense and present and past continuous tense, present perfect tense (only: I have got)
f Relative clause with the relative pronoun *who,* e.g. I see a man *who is carrying a ladder*
g Coordinating phrases with *and, or* and *but*
h Coordinating sentences with *and, or* and *but*
i Passive sentences, e.g. *He is called John*
j Modals *can, must* and *may*
k Non-finite verbgroup complement (group 1), e.g. I am going *to eat*
l Finite adverbial, e.g. *When it is raining,* what do you wear? The subordinating conjunctions *when, then* and *because* are taught
m Comparative clauses, e.g. *more cars than lorries*
n Discourse markers *now, then* and *first* are used to introduce conjuncts

MAPEP reading passages add the following structures and elements

o Subordinating conjunctions *so, before* and *so that*
p Non-finite verbgroup complement (group 2), e.g. Will you tell *me what to do, please*
q Non-finite postmodifier of N, e.g. Elephants have long noses *called trunks*
r Past perfect tense, e.g. *They had made twenty new pots*

4.2.1(b) How schemes prepare children for expository text

The two schemes, Day-By-Day and MAPEP, have different orientations towards language teaching. While Day-By-Day concentrates on teaching the children vocabulary from different lexical fields and some grammatical structures which can be used in communication, MAPEP seems to attach more importance to teaching process skills such as comparing and finding similarities and differences, and prediction. MAPEP also has a very low average sentence length of less than five words per sentence.

There are also some similarities between the two schemes, however. Both are teacher-centred courses which view language as a product rather than a process. As a result, language learning is regarded as a transmission of language structures, functions and notions to the learner. Neither of the courses prepares the children adequately for expository prose; their emphasis is on language used in everyday interactions between people, not on preparing the children for English-across-the-curriculum.

Looking at the two lists of structures and elements taught up to the end of Std 2, these lists look surprisingly similar. This leads to the expectation that statistics will be similar for the two schemes when compared with the four textbook passages. When one looks at the possible problem figures for both schemes (cf. Table 4.4 and Table 4.5), this expectation is fulfilled. MAPEP shows a slightly bigger disparity with the textbooks on the air compression passages (60% : 59% for Fox; 49,2% : 47,8% for Hamlyn) than Day-By-Day while it shows a slightly smaller disparity on the plant reproduction passages than Day-By-Day (55% : 57% for Fox; 22% : 27% for Hamlyn). The percentage of sentences which might pose a serious problem, however, is consistently higher for a child who has done the MAPEP course instead of the Day-By-Day one. From this it would seem that Day-By-Day prepares children better for the use of Std 3 content subject textbooks than MAPEP does. The figures for the sentences containing structures which have not been taught prove this point.

Although the two schemes seem to cover more or less the same language in their first three years, Day-By-Day covers more subordinating structures than MAPEP does. For example, finite verbgroup complements such as *I think (that) this is a girl* are often used in the expository paragraphs which were analysed.

4.2.2(a) Summaries of structures used in the textbook passages

Table 4.3 summarises the structures used in the four textbook passages. The numbers indicate the frequency with which that specific structure occurs in the 100 sentence extract. Matrices of the structures and elements used in the four 100-word passages which contain not only the structures and elements used, but also the sentences in which they occur and the frequency of their occurrence, can be found in Appendix 5. The numbers used in these matrices refer to the sentences in which the structures occur.

STRUCTURE	HAMLYN PLANT	HAMLYN AIR	FOX PLANT	FOX AIR
non-finite verbgroup complement (group 1)	8	7	9	6
non-finite verbgroup complement (group 2)	2	6	1	2
non-finite adverbial	2	1	5	7
non-finite complement of adjective	0	1	1	0
non-finite complement of preposition	0	1	2	4
non-finite subject	0	0	3	1
finite verbgroup complement	2	9	5	5
finite adverbial	5	12	17	16
subordinate yes/no question	0	1	0	0
non-finite postmodifier in NP	0	0	5	2
non-finite complement of noun	0	0	1	0
finite complement of noun	0	0	1	2
finite complement of adjective	0	0	0	1
subordinating conjunction	6	16	20	16
relative clause	2	11	4	12
Wh-clause	14	5	6	18
yes/no question	9	3	4	13
coordinated sentences	2	4	4	4
coordinated phrases	13	24	22	32
present participle phrase	1	1	4	5
past participle phrase	0	5	5	10
discourse marker	1	0	3	5
object complement	5	1	0	0
passive	5	8	13	14
asyndetic coordination	6	7	6	2
asyndetic subordination	1	8	2	1
incomplete sentence	0	7	3	0
apposition	0	5	2	1

Table 4.3: Syntactic structures used in textbooks

Table 4.4: Syntactic disparity between textbook passages and Day-by-Day

	UNKNOWN STRUCTURES	+ UNKNOWN ELEMENTS	+ POSSIBLE PROBLEMS	+ WH-QUESTIONS
DAY-BY-DAY & FOX (plants)	89% no problem 11% problem	60% no problem 40% problem	43% no problem 57% problem 20% serious problem	40% no problem 60% problem 21% serious problem
DAY-BY-DAY & FOX (air)	95% no problem 5% problem	58% no problem 42% no problem	41% no problem 59% problem 24% serious problem	30% no problem 70% problem 25% serious problem
DAY-BY-DAY & HAMLYN (plants)	95% no problem 5% problem	79% no problem 21% problem	73% no problem 27% problem 9% serious problem	73% no problem 27% problem 10% serious problem
DAY-BY-DAY & HAMLYN (air) text	94,1% n.p. 5,9% problem	76,2% n.p. 23,8% problem	52,2% n.p. 47,8% problem 13,4% serious	47,8% n.p. 52,2% problem 16,4% serious
DAY-BY-DAY & HAMLYN (air) glossary	72,8% n.p. 27,2% problem	69,7% n.p. 30,3% problem	39,3% n.p. 60,7% problem 35,0% serious	39,3% n.p. 60,7% problem 35,0% serious

Table 4.5: Syntactic disparity between textbook passages and MAPEP

	UNKNOWN STRUCTURES	+ UNKNOWN ELEMENTS	+ POSSIBLE PROBLEMS	+ WH-QUESTIONS
MAPEP & FOX (plants)	77% no problem 23% problem	60% no problem 40% problem	45% no problem 55% problem 27% serious problem	41% no problem 59% problem 28% serious problem
MAPEP & FOX (air)	80% no problem 20% problem	50% no problem 50% no problem	40% no problem 60% problem 31% serious problem	31% no problem 69% problem 31% serious problem
MAPEP & HAMLYN (plants)	91% no problem 9% problem	85% no problem 15% problem	78% no problem 22% problem 12% serious problem	67% no problem 33% problem 12% serious problem
MAPEP & HAMLYN (air) text	85,1% n.p. 14,9% problem	73,2% n.p. 26,8% problem	50,8% n.p. 49,2% problem 19,4% serious	47,8% n.p. 52,2% problem 22,4% serious
MAPEP & HAMLYN (air) glossary	66,7% n.p. 33,3% problem	54,6% n.p. 45,4% problem	36,4% n.p. 63,6% problem 43,4% serious	36,4% n.p. 63,6% problem 43,4% serious

4.2.2(b) How textbooks relate to children's competence

The authors of the two textbooks under discussion have not given equal attention to the language they use in their textbooks, probably because they are not equally sensitive to the linguistic problems peculiar to the black L2 English speakers they were writing for. The Fox passages, for example, are proven to be fraught with potential comprehension problems.

It seems that Hamlyn is well aware of the limited English competence which their audience might bring to their textbook, and they take special care not to use too much or too complex language. In their attempt to write text of which the syntax is understood by the children. However, they may have lost coherence of argument and used too few cohesive ties, so that the children might experience problems of a different order. (This problem will be discussed fully in Chapters 5 and 6.)

Fox, on the other hand, does not seem to have taken into account the competence of the children they were writing for. In fact, it rather looks as if the textbook was written for mother-tongue speakers of English. Yet the children seem to find the Fox passages as comprehensible as the Hamlyn ones in the Threshold test 'Testing Textbooks'. The intrasentential analysis results reveal a significant difference between the syntax used in these two books. Therefore there must be another factor interacting with the intrasentential aspects, which makes complex syntax easier to understand (cf. Chapters 5 & 6).

4.2.3(a) Results of disparity comparison

The results of the comparisons between the structures taught in the schemes and the structures used in the textbooks can be found in tables 4.4 and 4.5. Table 4.4 contains the statistics for all four textbook passages when compared with Day-by-Day. Table 4.5 contains the statistics arrived at by comparing the textbook passages with those structures taught in MAPEP. The number of sentences which are predicted to contain problematical structures and elements for Day-by-Day or MAPEP children is expressed as a percentage of the total number of sentences analysed in each textbook passage.

Figures in the first two columns of these tables represent the first stage of comparison or the **idealised, purely analytical** stage. The theoretical adjustment of including the syntactic structures used in the readers results in the more **realistic** view of the data represented in column three, while the fourth column figures point to the extent of the problem when aspects which were **practically experienced** to create comprehension problems are included (cf. section 3.4.2(c)).

For the first column, two percentages are given, the first being the percentage of sentences in which no problem exists, and the second the percentage which may pose serious comprehension problems as they contain

structures which have not been taught in the scheme. The second column also contains two percentages. The first statistic again refers to the percentage of sentences for which no comprehension problem exists. The second percentage in this column indicates the percentage of sentences for which a comprehension problem is expected. This percentage is now cumulative - it takes into account those sentences with unknown structures as well as lexical items which have not been taught. These first two columns indicate the syntactic disparities between the textbook passages and the schemes which represent possible English competencies of the children in Std 3.

The third and fourth columns each contain three figures. The first figures represent the percentage of sentences for which no comprehension problem is predicted. The second figures represent the cumulative percentages of sentences which are expected to pose comprehension problems to the children having done the specific ELT scheme in question. The last figures point to the cumulative percentages of sentences which are thought to pose serious comprehension problems to the child reading them.

Both tables have two sets of data for the Hamlyn air passage, splitting the data on the expository text and that on the glossary, as these two were found to be so different in linguistic content.

4.2.3(b) Discussion of the syntactic disparity

In grammatical terms, how big is the disparity between language taught up to the end of Std 2 and competence assumed in Std 3 science textbooks?

It differs depending on the passage and the scheme looked at. Therefore the disparity between textbook passages and the Day-By-Day English Course will be discussed first, and that between the textbook passages and the MAPEP Course thereafter.

The disparity between what has been learnt and what is expected is most pronounced for the air passage in Hamlyn, i.e. 60,7% of the sentences have a possible comprehension problem of some order if one is looking at the data realistically. 27,2% of these 33 sentences contain a structure which has not been taught at all and 30,3% of the sentences contain a structure and/or an element that has not been taught before. The last 33 sentences of this passage consist of a glossary and as such this is not a typical expository passage. It is a convention used especially for the L2 audience, so that they may look up the meaning of unfamiliar words or concepts. A glossary in an L2 textbook could make the reading of this textbook less traumatic. Unfortunately, this specific one fails in its intention.

For the typical expository texts, the disparity between the English learnt up to the end of Std 2 and the English used in these Std 3 textbooks is biggest for the passages taken from Fox. Analytically speak-

ing, 5% of the Fox air sentences and 11% of the Fox plant sentences contain structures the children have not been taught. Adding unknown elements to this, the figures rise to 42% problem sentences for the Fox air passage and 40% problem sentences for the Fox plant passage. Although both passages have a high incidence of unknown elements, this phenomenon is most pronounced for the Fox air passage in which 37% of the sentences have such elements. Seen in a more realistic light, after the theoretical adjustment, the air passage is also predicted to pose the most comprehension obstacles to a child who has been taught the Day-By-Day Course. For the plant passage, 57% of the sentences might pose a comprehension problem of some sort; 20% of the sentences might even pose serious comprehension problems. For the air passage, the problem sentences form a slightly higher percentage, i.e. 59%, but the serious problems rise to 24% of the 100 sentences.

The two passages taken from Hamlyn have more or less the same number of unknown grammatical structures in them as the Fox air passage (5% and 5,9% opposed to 5%). When the unknown elements are added, however, the predicted difference between the two textbooks becomes more marked. The Hamlyn passages contain 21% (plant) and 23,8% (air) sentences with unknown elements, structures or both. These figures differ greatly from the figures for the Fox passages, i.e. 40% (plant) and 42% (air).

There is also a big difference in possible problem sentences between the Hamlyn plant passage and the Hamlyn air passage, i.e. 27% vs 47,8%. This high percentage of problem sentences in the air passage might be ascribed to the fact that air compression is a more abstract concept and as such needs more complex language to explain it.

It is interesting to note the high incidence of unknown grammatical elements. When comparing the first two columns of Table 4.4 and 4.5 - sentences with unknown structures and sentences with unknown elements and/or structures - it becomes clear just how many grammatical words are used of which the children have not yet learnt the meanings.

Thus far only the first three columns have been discussed. The fourth column represents the data after a practical adjustment has been made and the competence of the children as revealed by the Threshold Wh-question test has been taken into account. It includes Wh-questions as a possible problem even though these structures are taught and used often in the schemes, because the Threshold Project found that children do still experience problems with Wh-questions. From the statistics in the fourth column we can deduce that the actual problems children experience in understanding the grammar used in Std 3 textbooks may well be more numerous than indicated by the 'possible problem sentence' statistics (cf. Allwright 1986; Krashen 1981).

When the statistics for each passage are compared to a competence equal to the MAPEP Course, we see that the disparity between the textbook language and the language taught is even greater than for the Day-By-Day scheme. Although the percentages differ, however, the patterns remain the same.

The glossary once again proves to be the most difficult text, with a 33,3% problem of unknown structures which rises to 60,7% possible problem sentences and a 35% possibility of serious incomprehension.

The Fox passages show a bigger disparity with the scheme than do the Hamlyn sentences for unknown structures. The two air passages also seem potentially more difficult than the plant passages, once again probably because the concept is more abstract. And when one takes a more realistic view by adding Wh-questions as possible problem sentences, the comprehension hurdles facing the children also seem bigger than is suggested by the more analytic data.

4.3. VOCABULARY

The results of the analysis of vocabulary items in the schemes and the textbook passages will be presented and discussed in the following order:

4.3.1. Results and discussion of the vocabulary taught in the schemes
4.3.2. Results and discussion of the vocabulary used in the textbook passages
4.3.3. Results and discussion of the disparity between vocabulary taught and that used

4.3.1. The ELT schemes

On the basis of the vocabulary lists drawn up, the schemes seem to teach roughly the same number of vocabulary items. Day-by-Day purports to teach 850 items and MAPEP 832.

When reading through the vocabulary list compiled for MAPEP for the purposes of this study, some very common words such as *teacher, say, see, door* are conspicuous by their absence. This is a result of only having used the vocabulary items given as taught in the scheme of work to compile this list. This finding suggests that MAPEP does not provide comprehensive information about vocabulary to the teachers using their manuals. However, the vocabulary list provided by MAPEP in its scheme of work was used. It thus has to be kept in mind that MAPEP disparity results may be inadvertently overpredicted as a result of the method used to compile its vocabulary list.

4.3.2. The science textbooks

The statistical results for the four textbook passages are presented in Table 4.6. These results give a further indication of the relative com-

plexities of these passages. The air passages seem more complex than the plant passages, possibly because the concept is more abstract and therefore needs more words to explain it. Fox also uses more vocabulary items than Hamlyn in its passages. The difference between the number of different words used in the two air passages is very small, but the difference in the number of words used to discuss plants is strikingly large.

TEXTBOOK PASSAGE	NO. OF ITEMS
Hamlyn, Rogan & Rogan (plants)	143
Hamlyn, Rogan & Rogan (air)	258
Fox et al (plants)	238
Fox et al (air)	261

Table 4.6: Vocabulary items used in textbooks

4.3.3. The disparity

When comparing the vocabulary taught in the schemes with that used in the textbooks, the results of the disparity are as follows:

SCHEME	PASSAGE	% WORDS NOT TAUGHT
Day-by-Day	Hamlyn et al (plants)	38,4
	Hamlyn et al (air)	38,7
	Fox et al (plants)	42,4
	Fox et al (air)	41,3
MAPEP	Hamlyn et al (plants)	53,1
	Hamlyn et al (air)	55,4
	Fox et al (plants)	52,9
	Fox et al (air)	54,4

Table 4.7: Vocabulary disparity results

An interesting pattern results. When compared with Day-by-Day, the biggest vocabulary disparity is found in the two Fox passages, but when compared to MAPEP, Hamlyn shows the bigger disparity in terms of vocabulary. This may be ascribed to the absence of some commonly used words in the MAPEP vocabulary list, words which Hamlyn uses because they should be included in a list of high frequency vocabulary items, while Fox uses more sophisticated vocabulary.

When comparing disparity results for the two schemes, Day-by-Day consistently shows less disparity with the vocabulary used in the textbook.

The difference between the scores for the two schemes is such that it cannot be caused solely by the omission of familiar words from the vocabulary list. This leads to the tentative conclusion that Day-by-Day seems to prepare its children better for the demands of cross-curricular lexis. However, even the lowest disparity figure, 38,4% (between Day-by-Day and the Hamlyn plant passage) is higher than one would like to see. The other figures - the highest disparity statistic being more than half of the words - are even more disconcerting.

Although the vocabulary disparity picture tends to look bleak, one has to remember that the reader learns to interpret unfamiliar words which occur repeatedly in a text. Thus the meaning of words such as *assignment, summary, seed, cotton-wool, jar, root* will become clear through repetition and practical use in class.

One can conclude from this analysis that the schemes should pay more attention to vocabulary which is used across the curriculum. If the children already know the meanings of more of the words now shown to be unfamiliar, children will have more processing time to devote to comprehending the concept being taught (Flood & Lapp 1988).

On the other hand, textbooks can contribute to better comprehensibility of vocabulary in two ways. Firstly, textbook authors can use common words such as *wind, mealie, seed* in place of the less familiar synonyms like *breeze, maize, grain* (Lanham 1989). In choosing lexical items when one writes for young L2 readers, the following simplified guidelines can be kept in mind (Williams 1985: Chapter 3).

a Use familiar words instead of unfamiliar ones as explained.
b Concrete words are more readable than abstract ones, e.g. *blood, sweat, toil and tears* instead of *heroism, effort, energy and unhappiness*.
c Idioms may cause problems to the immature L2 reader.
d Active verbs are more readable than nominalizations, e.g. *germinate* instead of *germination*.
e Shorter words are more readable than their longer synonyms, e.g. *gives/assigns, help/assistance, buy/purchase*.
f Words taken from unsimplified extracts or primary source material may be too difficult for the children.
g Avoid homonyms where possible, e.g. *light* (noun), *light* (verb), *light* (adjective).
h Use terminology only when necessary.
i Carefully choose intensifiers, e.g. *definitively, completely* and *partly* and use them sparingly.
j Noun compounds may be difficult to comprehend, e.g. *canal irrigation system = a system of irrigation by means of canals*.

Secondly, authors of textbooks should introduce new vocabulary items in such a way that their audience is sure to grasp their meaning. The glossary used in Hamlyn is one example of how words should not be introduced or explained. It was also found in the Threshold Project test entitled 'Plants and Man' (cf. section 5.2.1) that only 50% of the Std 3 children from the two schools in Bophuthatswana knew the convention of explaining the meaning of a lexical item by writing a synonym in brack-

ets after the unfamiliar word, e.g. *Look at the beak (mouth) of the weaver*. Williams (1985:22-24) suggests several ways of familiarizing readers with unfamiliar or unknown vocabulary. The extent to which each textbook has made use of these strategies is discussed simultaneously:

a Use background knowledge to draw analogies.
Hamlyn uses the pumping of a bicycle tyre to introduce the concept of air compression. The fact that children may grow plants at home and have established theories about the process is not capitalised upon. Fox uses the image of sleeping seeds which can be woken up, the fact that one needs food for strength, death by drowning and ventilation in buildings and mines, all of which may possibly be part of the readers' background knowledge.

b Use illustrations with labels.
Hamlyn seldom uses illustration labels. The child is referred to the pictures and some pictures are an integral part of the text, but often the picture illustrates an experimental method, and is not even referred to in the text itself. Fox uses illustration labels more often. These labels mostly occur underneath the picture, giving it a number and a name. Most of these pictures are referred to in the body of the text. The problem here lies in the finding of the Threshold Project that this manner of referral is not always effective.

c Contrast the unknown word with its more common meaning.
This strategy is not often used in either textbook, although examples such as the following can be found: *'Di' means two* and *Compressed means squeezed together* (Hamlyn) and *These things that we know about air are called the properties of air* (Fox).

d Restate the unknown item in more comprehensible terms.
This strategy is also not used often. Fox makes slightly more use of it than Hamlyn. The following examples were taken from each book: *A draught is when the air moves a little in a room* (Hamlyn) and *Putting fresh air into buildings and mines is called ventilation* (Fox). Further Fox examples include the comparison of germination to waking up and a model of cotyledons made with one's hands and an eraser.

e Provide a mother-tongue translation in brackets following the unknown item.
This strategy is never used in either textbook. The use of the mother-tongue is frowned upon by teachers and is not encouraged in any of the schemes, possibly because it is feared that it may lead to the exclusive use of the L1. However, what Williams proposes here is the quick use of a word in the mother-tongue to call up the rich conceptual schema which the child may already have acquired in the mother-tongue.

It should be clear from the discussion so far that it is of critical import that the textbook author has a sound knowledge of the reading vocabulary of his intended audience. An author can only write readable texts for an audience if he has a sound knowledge of what that audience is capable of linguistically. The textbook author therefore has to know

what reading vocabulary the reader brings to the text, so that he can use those words rather than unfamiliar synonyms.

As a result of using the vocabulary lists provided in the teacher's manual's scheme of work, a precise pronouncement about the extent of the vocabulary disparity between the schemes and the textbook passages cannot be made. But the small-scale investigation done was enough to indicate that an uncomfortably large disparity may exist. Even this tentative conclusion should convince textbook authors to introduce lexical items more carefully, taking Williams' guidelines to heart. It should also persuade the authors of English language teaching schemes to investigate the language-across-the-curriculum needs of their audience. This should contribute to the ideal teaching and learning situation where the language teaching schemes prepare children better for the across-the-curriculum vocabulary they will encounter and children find their textbooks readable.

CHAPTER 5

CROSS-SENTENTIAL ANALYSIS: RESULTS AND DISCUSSION

Analysis of the cross-sentential aspects of the science textbooks and English language teaching schemes consists of two parts, i.e. cohesion and coherence analysis. The cohesion results will be given and discussed fully before coherence is dealt with.

5.1. COHESION RESULTS AND DISCUSSION

The analysis of cohesion can be done on two axes - (a) the types of cohesion in the schemes and textbooks and (b) the proportion of cohesive devices in the texts. The discussion of the results of the cohesion study will therefore be divided in this way. It must be kept in mind that this division is one of convenience, and that both axes must be considered in order to make any judgement about the contribution to comprehensibility of any of the cohesive ties discussed.

5.1.1. Axis one: familiar and unfamiliar cohesive elements

A. THE ELT SCHEMES

Neither of the schemes teaches any cohesive elements per se. The elements on which this discussion is based would be generated orally in the classroom and are found in readers in cohesive contexts, performing cohesively, but nowhere are the children taught to use cohesive elements to make sense of a text they do not fully comprehend. Compare herewith the importance attached to the teaching of cohesion in the more recently written course *Bridge plus One*. Although it has not yet been proven, it is thought that specific knowledge of cohesive ties could provide children with much needed skills for making inaccessible texts more accessible. Respected writers such as Perera, Tonjes and Davies all advocate the explicit teaching of cohesion (and coherence) skills so that children may be better equipped to deal with the complexities of expository text (in Gillham 1986). Most of the research done in this field has been done with secondary first language pupils. However, it has been the experience of Macdonald (personal communication) that children in Std 3 can be taught to find main ideas and topic sentences in paragraphs, as well as to determine what the intention of the author was in writing that specific text. What second language primary school children could manage and exactly how it will influence their comprehension of texts which they had found difficult to read would be an interesting question for further research.

FOUND IN BOTH SCHEMES
11.6 What do we call Joseph? We call **him** a boy. singular masculine pronominal, function: head
12.6 Mary washes the clothes. **She** hangs them on the line. singular feminine pronominal, function: head
13.6 This hat is new. I bought **it** yesterday. singular neuter pronominal, function: head
14.6 Bird. Bed. Are **they** the same? plural pronominal, function: head
11.8 John fell off the chair. He hurt **his** leg. singular masculine pronominal, function: possessive deictic
21.6 I have two hats. **This** hat is new. near demonstrative, function: nominal deictic
22.6 This is the room we sleep in. What room is **that**? far demonstrative, function: nominal head
23.6 A mouse is going to a house. **The** mouse looks into the kitchen. definite article, function: nominal deictic
22.7 I walked to where the bus stops. The bus wasn't **there**. far demonstrative, function: place adverbial
31 Bird. Bed. Are they the **same**? identity comparative
33 Are they **different**? difference comparative
34 I don't want **more** goats quantity comparative
35 Who is the **tallest**? quality comparative

FOUND IN DAY-BY-DAY ONLY
14.7 They took their donkey with **them**. plural pronominal, function: possessive head
21.7 **Here** is a picture of one of the cameras. near demonstrative, function: place adverbial

FOUND IN MAPEP ONLY
12.8 She raised **her** arms above her head and thanked Jesus and God. singular feminine pronominal, function: possessive deictic
13.8 It picked up the rabbit in **its** mouth. singular neuter pronominal, function: possessive deictic

Table 5.1: Reference in the language schemes

Day-by-Day and MAPEP use a variety of referentially cohesive ties. Table 5.1 shows which reference types are found in both schemes (the numbers correspond to Halliday and Hasan's coding scheme in their 1976 version):

Although the children do not learn all the reference types there are, the schemes cover a wide range of referentially cohesive elements and types. Day-by-Day could have given more attention to the possessive function of referential items, like MAPEP has done.

During the investigation of the teacher manual and the stories for listening to and reading, the conjunctions in Table 5.2 were found in the schemes:

FOUND IN BOTH SCHEMES C11.1 What is this? **And** what are they? simple additive C23.1 The sun smiled, **but** the wind went away. simple contrastive C31.1 It didn't help the man. **So** the man got on his horse and rode away. general causal C33 I am eating **because** I am hungry. reversed causal 41.1 I wake up, **then** I get dressed. simple sequential temporal
FOUND IN DAY-BY-DAY ONLY C41.3 He touched his nose **before** he did that. simple preceding temporal C43.1 **First** Mr Tema showed them the button on top of the camera. sequential correlative temporal C44.2 **Soon** they met some more people. interrupted complex temporal C44.6 Wave your hands **until** I say stop. terminal complex temporal C5 **Well**, soon they met some more people. continuative
FOUND IN MAPEP ONLY C21.2 He often came to the village in June and July **but** he always came in November. proper adversative (with additive meaning) C44.7 Look at the roof. **Now** look at what the family eats and drinks. punctiliar complex temporal

Table 5.2: Conjunctions in the language schemes

Not many conjunctions are taught in the three school years which both schemes cover. Conjunctions which are used in the reading passages but which have not been mentioned because they do not occur in the reading passages analysed for the cohesion analysis are:

Day-by-Day:	MAPEP:
or	or
as	when
now	first
	before
	so that

The question remains whether the schemes succeed in preparing their children adequately for the conjunctions found in their Std 3 content subject textbooks given that they teach those mentioned in the syntax and cohesion analyses.

The danger inherent in analysing conjunctions lies in the fact that the same lexical item can function to signal a variety of cohesively conjunctive relationships in different linguistic environments. A child having learnt one function might impose that meaning on the word without further thought, and draw incorrect conclusions about the meaning of the text before him. For example, the word *then* is taught by Day-by-Day and MAPEP to be a temporal, simple sequential conjunction, e.g. *I put water in the pot. Then I put mealie meal in the pot.* However, the word *then* not only functions as temporal conjunction, but is also used as a causal conjunction, e.g. *You hit him in the face. Then he wants to hit back.* At least five distinctions can be made in the use of *then* as temporal or causal conjunction, but they are fine distinctions which will not concern children at the level to which this study is restricted. The major distinction is the temporal-causal one. Should a child then impose the temporal meaning of the word *then* when reading the sentence *You hit him in the face. Then he wants to hit back.* the causal relationship between the two sentences will not be understood.

The two schemes teach only three common elliptical structures which act cohesively. Day-by-Day teaches five and MAPEP two additional ellision types. These are exemplified in Table 5.3.

As this study is looking at texts only, ellipsis does not play an important cohesive role. However, ellipsis is more common in informal speech than it is in writing. Therefore ellipsis might be taught in more detail by the language schemes, because the children should be prepared to understand informal speech, even out of class context.

FOUND IN BOTH SCHEMES E12.2 How many pencils are there? Five. nominal ellipsis, cardinal number as head E21.1 Yesterday I went to the shop. Did you? verbal ellipsis, total lexical verb ellision E33.2 Is it a tin? Yes. clausal ellipsis, only polarity present
FOUND IN DAY-BY-DAY ONLY E11.1 Benny was not pleased (with the pictures) He said, "We can't send these to Uncle David." nominal ellipsis, specific deictic as head E11.2 Are they good photographs? Some are very good. nominal ellipsis, non-specific deictic as head E13.1 The boys held a race. Who was the quickest? nominal ellipsis, superlative as head E31.1 Will you help me move the table? Yes, of course. clausal ellipsis, total propositional ellipsis
FOUND IN MAPEP ONLY E12.3 Here are six sticks. How many more are there? nominal ellipsis, indefinite as head E33.3 Which animal has the longest body? The crocodile. clausal ellipsis, single element present

Table 5.3: Ellipsis in the language schemes

No common substitutions are found in the schemes as is the case with reference, conjunctions and ellipsis. Day-by-Day only teaches two substitutions, i.e.

FOUND IN DAY-BY-DAY S11 Which picture do you like? I like this one. nominal substitute for head noun S24 He touched his arm. He touched his nose before he did that. verbal substitute, verbal reference

Table 5.4: Substitutions in the language schemes

Substitution, like ellipsis, is also more common in speech and informal situations than in the kinds of text currently being examined. As such, the same comments apply.

Both schemes make use of an encompassing range of lexical cohesion in their teacher talk and reading/listening material. Lexical cohesion is the only type of cohesion which cannot be avoided when writing text. As soon as one writes about a specific topic, one has to use either the same words repeatedly, or use synonyms to describe or mention it again. Thus, as lexical cohesion is not gov-

erned by the choice of the author as the other types of cohesion are, it is not included in this section of the discussion.

It is clear that both schemes are lacking in ellipsis and substitution. This is not reflected in the disparity comparison between the textbooks and the schemes, as the textbooks do not use these devices either. However, it is believed that this is a severe gap in the planning of these schemes, as the informal conversations children may have inside or outside their classroom environment may provide occasions for the use of ellipsis and substitution.

B. THE SCIENCE TEXTBOOKS

The most striking difference between the two texbooks' use of cohesive devices is Fox's use of conjunctions and Hamlyn's lack of them. In the 'ideal' theoretical situation stated repeatedly as premise in this study, Hamlyn would be more comprehensible than Fox, and Fox considerably less comprehensible than Hamlyn on the basis of this finding only. However, as mentioned previously (cf. section 3.4.2.C; 3.4.3.A), children often understand what they have not been taught and sometimes do not understand things they have explicitly been taught (Allwright 1986; Krashen 1981). This use of conjunctions by Fox therefore, may underlie its unexpectedly high comprehensibility score in the Threshold comprehensibility test (cf. section 3.3).

Also striking is the fact that neither textbook exploits ellipsis or substitution as cohesive devices. This becomes even more interesting in the light of the sample cohesion analyses and their model answers in Halliday and Hasan's handbook (1976:340-355). Of the seven passages given for analysis, four incline more to the formal pole of the formality continuum, i.e. the Alice in Wonderland excerpt, the sonnet, the passage written by Yeats and the report of an interview. The other three passages, the transcribed conversation, the dramatic dialogue and the informal interview with children, are more informal. Neither the Alice passage nor the sonnet contain any instances of cohesive ellipsis or substitution. The Yeats passage contains only one instance of substitution, and the reported interview one instance of ellipsis and one instance of substitution only. The more informal passages, on the other hand, contain multiple instances of both ellipsis and substitution.

It thus seems that more formal genres are characterised by little or no ellipsis and substitution as cohesive devices. This might explain the distinct lack of these two devices in the textbooks - although the authors try to minimise the distance between themselves and their audience, expository text in content subject textbooks of today remains written in a formal register.

The use of referential and lexical cohesion in the two textbooks does not differ dramatically. Demonstrative reference accounts for most referentially cohesive ties. Nominal and comparative reference occurs comparatively little. This might be ascribed to the fact

that the subject matter concerns concepts and experiments, not people. The same item lexical cohesion category surpasses the occurrences of synonyms, superordinates, general nouns and collocations. The high occurrence of this type of lexical cohesion might also be a function of simply talking about the same topic or concrete element. For example, the plant passages in both textbooks cover three experiments testing whether seeds need water, air and warmth to germinate. By the nature of the experiments in each book, similar apparatus and method is used for all three the experiments. The format of reported experiments also lends itself to same item, same referent lexical cohesion. The apparatus needed is listed. Then the method describes how these jars, seeds, saucers etc. should be used. The nature of the content of a text can thus prescribe to a certain degree what type of cohesion might most commonly be used.

C. THE DISPARITY

The referential cohesive elements used by Hamlyn should not pose any problems to the Std 3 reader having done either of the two language schemes, as all types used in the textbook passage will have been taught to them.

The referential cohesive elements used in Fox, however, may not all be grasped by children having done either Day-by-Day or MAPEP. The problem lies not with the plant reproduction passage, but with the passage about air compression. Neither Day-by-Day nor MAPEP teaches the pronominal reference *its* occurring as possessive in sentences such as *Place the shape you have cut out on a soft book, then use a pencil to press a small dent in its centre.* Any problem that might arise from this, however, should be miniscule.

Fox also uses all four types of conjunction, i.e. additive, adversative, causal and temporal. Of the four types, temporal conjunctions are used most frequently. The Fox plant passage contains the following conjunctions:

Additive:	apposition, exemplificatory:	such as, as
Adversative:	contrastive, simple:	but
Causal:	specific, reason:	therefore
	specific, purpose:	in order to
Temporal:	simple, sequential:	now, then

Of these, the additive and causal conjunctions are not taught by either the Day-by-Day or the MAPEP schemes, so that the Std 3 child reading this passage in Fox might not understand the relationships signalled by these conjunctions.

The Fox air compression passage does not use exactly the same conjunctions as those used in the passage about plant reproduction. The conjunctions used in the air passage are:

Additive:	apposition, exemplificatory:	like
Causal:	specific, result:	so that
	reversed causal:	because
Temporal:	simple, sequential:	then, now
	complex, immediate:	suddenly
	internal, temporal:	now

Of these, only the reversed causal and simple sequential temporal conjunctions *(because, then, now)* are taught by MAPEP and used by Day-by-Day in its reading passages.

After having analysed both passages of Fox, the schemes' failure to teach the children an adequate set of conjunctions to help them cope with Std 3 expository texts becomes apparent. Of the twelve different conjunctions used in these 200 sentences, only four (*but, now, then* and *because*) are taught before Std 3.

The Hamlyn plant reproduction passage, on the other hand, contains no conjunctions, and the air passage contains only three occurrences of the reversed causal conjunction *because* which both schemes teach. The Std 3 child having gone through either Day-by-Day or MAPEP should therefore have no problem in comprehending the conjunctions used in the four passages.

To summarise, then, the passages taken from Hamlyn contain no cohesive elements Day-by-Day or MAPEP Std 3 children have not encountered before. The passages taken from Fox, on the other hand, contain both referential and conjunctive cohesive items which may be unfamiliar to these children.

So the Hamlyn passages contain no unfamiliar cohesive elements. Children should be able to understand all the cohesion in their air and plant passages. The question remaining is whether these authors, in adapting their language use to what Std 3 children have been taught, are not forced into writing **impoverished** text - text which is poor in concepts because the language resources have not been exploited and which consequently may not lead to a rich conceptual development.

One very crude measure of this would be the length of a textbook. Fox and Hamlyn both cover the same syllabus. Fox, however, is 239 pages long while Hamlyn only covers 134 pages. This crude measure suggests that Fox interprets the syllabus more richly than does Hamlyn. Both approaches have their advantages and disadvantages. Fox explains and exemplifies concepts in more detail. This may ensure that the child develops a better understanding of a particular concept. The concept of seeds waiting for the correct circumstances before germinating, for example, is explained by analogy to someone who looks dead, but is in fact sleeping and only has to be woken up to do something. This example makes the concept very clear on condition that the child comprehends the rather complex language it is embedded in. Hamlyn, on the other hand, does not explain this concept at all in their attempt to meet the child on his own linguistic developmental level. The text in this book has the advan-

tage that the children may comprehend better what they are reading, but the result may not be the same richness of conceptual knowledge Fox could induce.

The effect of text impoverished both on the linguistic and conceptual level of children learning through such a text remains an interesting question for further research.

In comparing the types of cohesion used in the textbooks and the schemes, one not only has to look at the disparity between the Std 2 and Std 3 texts, but also has to compare the cohesive devices used in the two schemes to see whether one scheme prepares the children better for the linguistic demands of Std 3 content subject textbooks. One also has to compare the cohesive devices used in the two textbooks to see which textbook is more related to the linguistic proficiency of their audience.

In the discussion of the types of cohesive categories and elements found in the schemes and the texbooks, Day-by-Day was constantly shown to contain more cohesive items than MAPEP. Fox was also shown to make considerably more cohesive demands on its addressees than Hamlyn does. On this basis of the first axis of cohesion analysis, Day-by-Day seems to prepare children better for the cohesion demands in Std 3 textbooks and Hamlyn seems to relate more to its addressee's linguistic competence than Fox does.

The first axis of the analysis of cohesion, that of the familiarity or unfamiliarity of cohesive devices used, has been discussed above. The second axis of the analysis of cohesion, that of the proportion of the cohesive devices used, will now be discussed.

5.1.2. Axis two: the proportion of cohesive devices used within each text

A. THE ELT SCHEMES

The different types of cohesive devices found in the schemes have been discussed above. However, one not only has to analyse the different types of cohesive device used, but one also has to analyse the manner in which they are used in relation to each other. The results of such a proportionate analysis for the schemes are presented in Table 5.5 and Table 5.6.

The tables contain figures which express the use of each cohesive device as a percentage of the total number of cohesive ties analysed. The categories which have been used correspond to those used by Halliday and Hasan (1976).

In comparing the schemes, two different comparisons were made. Passages from the same scheme were compared with each other, and passages from Day-by-Day were compared to passages from MAPEP. The

passages which were used were the same as those analysed and reported on under the heading Axis one: familiar and unfamiliar cohesive elements.

LEXICAL COHESION

	Camera	Donkey
SAME-ITEM	40,9	46,7
SYNONYM	8,4	10,1
HYPERNYM	0,8	-
GENERAL WORD	2,5	3,7
COLLOCATION	9,4	0,7

REFERENTIAL COHESION

	Camera	Donkey
PRONOMINAL	17,7	17,7
DEMONSTRATIVE	7,5	10,0
COMPARATIVE	0,8	-

CONJUNCTIVE COHESION

	Camera	Donkey
ADDITIVE	0,8	0,7
ADVERSATIVE	1,7	-
CAUSAL	-	2,3
TEMPORAL	5,1	3,0
OTHER	-	0,7

ELLIPSIS

	Camera	Donkey
NOMINAL	1,6	2,3
VERBAL	-	-
CLAUSAL	0,8	0,7

SUBSTITUTION

	Camera	Donkey
NOMINAL	-	-
VERBAL	0,8	-
CLAUSAL	-	-

Table 5.5: Proportionate use of cohesive devices in Day-by-Day

LEXICAL COHESION

	Mfundo	Biblical
SAME-ITEM	48,6	50,9
SYNONYM	3,6	5,3
HYPERNYM	1,2	-
GENERAL WORD	1,2	-
COLLOCATION	13,4	9,7

REFERENTIAL COHESION

	Mfundo	Biblical
PRONOMINAL	10,8	25,8
DEMONSTRATIVE	9,6	2,1
COMPARATIVE	1,2	-

CONJUNCTIVE COHESION

	Mfundo	Biblical
ADDITIVE	1,2	-
ADVERSATIVE	-	2,1
CAUSAL	-	2,1
TEMPCRAL	3,6	1
OTHER	-	-

ELLIPSIS

	Mfundo	Biblical
NOMINAL	-	-
VERBAL	-	-
CLAUSAL	4,8	-

SUBSTITUTION

	Mfundo	Biblical
NOMINAL	-	-
VERBAL	-	-
CLAUSAL	-	-

Table 5.6: Proportionate use of cohesive devices in MAPEP

The two last stories from the *Day-by-Day* Std 2 reader (Appendix 6) which were analysed have very similar cohesion. The differences which do exist may well be functions of the different themes of the stories. The story about the camera has more collocation because the parts of the camera and the process of film developing are discussed. This also accounts for the number of temporal conjunctions used. The story about the donkey uses more repetition of the same item to create a repetitive pattern. The nature of the story can also account for the preference for causal conjunctions. On the whole, the textures of the Day-by-Day texts are very similar.

The cohesion used in the different MAPEP passages (see Appendix 7), in contrast, is not so similar. The use of cohesion in the two listening comprehension stories (Mr Mfundo and the biblical story) can be explained by the nature of the topics covered. The Mfundo passage has more collocation because the port with all its activities is described. The biblical story has more pronominal reference because it is a story about people, not about things as the Mfundo passage is with its more demonstrative reference. The short reading passages found in the pupil's book in the MAPEP course, on the other hand, differ vastly in their use of cohesive devices. There seems to be no pattern in the use of cohesive elements, and the differences can also not be explained as the differences in the other passages can. This problem might be explained by the length of these passages. It is possible that such short texts do not lend themselves to this kind of analysis.

Because the reading passages do not use cohesive devices similarly, and these passages are too short to determine what the typical use of cohesive devices in the MAPEP scheme is, only the listening comprehension stories were used when MAPEP was compared to Day-by-Day.

Day-by-Day was found to use synonyms and general nouns to a greater extent than MAPEP, while MAPEP uses more same-item cohesion and collocations than Day-by-Day. The schemes use superordinates similarly. No definite trends were found in the use of referential cohesion; results differed depending on which passages were compared. One could therefore say that the schemes made similar use of reference. Conjunctions were found to be used with the same frequency in both schemes, but Day-by-Day uses a wider variety of

temporal conjunctions than MAPEP does. In the passages analysed, Day-by-Day also uses a wider variety of ellided structures, yet MAPEP uses its limited set of ellisions with greater frequency than Day-by-Day. Substitutions are treated in similar fashion in the two schemes.

The above discussion of the proportionate use of cohesive devices, leads to the following conclusion: Day-by-Day does not seem to differ greatly from MAPEP in its teaching of cohesion. It teaches but a little more than MAPEP, and then only for some of the categories. Yet it is precisely this seemingly small difference which will be shown in the disparity discussion to set the two schemes apart when a child has to be prepared for a textbook of the calibre of Fox.

B. THE SCIENCE TEXTBOOKS

Table 5.7 contains the results of the analysis of the proportionate use made of each cohesive device in the textbook passages. As for Table 5.5 and Table 5.6 this table indicates the proportionate use made of each cohesive element by expressing the use made of each element as a percentage of the total number of cohesive ties analysed.

The similarity in differences between the air and plant passages for both Fox and Hamlyn is striking. This suggests that the topics of these passages dictate to a certain extent the type of cohesive texture such a passage will have.

For both textbooks the plant passage has more same-item lexical cohesion than the air passage. The lexical cohesion of each plant passage also accounts for a slightly higher percentage of the overall cohesion of the text than it does for the air passages. Both plant passages have more nominal reference while both air passages contain more demonstrative reference ties. The referential cohesion ratios for the two air passages are also slightly higher than those for the two plant passages.

When the two books are compared, there are both differences and similarities to be found. They differ vastly in their use of conjunctions, Fox using many while Hamlyn uses only *because* and then only in the air passage. Fox also tends to have a higher ratio of referential cohesion than Hamlyn. As neither Fox nor Hamlyn passages use substitution or ellipsis, the proportionate use of substitution and ellipsis as cohesive devices in Fox and Hamlyn cannot be calculated.

LEXICAL COHESION

	Fox plant	Fox air	Hamlyn plant	Hamlyn air
SAME-ITEM	62,0	50,6	60,3	52,0
SYNONYM	7,8	6,6	4,0	10,7
HYPERNYM	0,6	1,5	3,2	1,4
GENERAL WORD	1,8	3,7	-	-
COLLOCATION	4,2	10,6	18,5	17,3

REFERENTIAL COHESION

	Fox plant	Fox air	Hamlyn plant	Hamlyn air
PRONOMINAL	5,4	3,7	3,2	1,4
DEMONSTRATIVE	9,0	13,5	8,8	12,9
COMPARATIVE	2,4	2,1	1,6	1,4

CONJUNCTIVE COHESION

	Fox plant	Fox air	Hamlyn plant	Hamlyn air
ADDITIVE	1,2	0,7	-	-
ADVERSATIVE	0,6	-	-	-
CAUSAL	1,8	2,9	-	2,1
TEMPORAL	2,4	2,9	-	-
OTHER	-	-	-	-

Table 5.7: Proportionate use of cohesive devices in textbook passages

C. THE DISPARITY

In order to summarise the disparity between the cohesion taught by the two language schemes and that used in the textbooks, the proportionate use of each cohesive category for the textbook passages was compared to that of each of the schemes. The proportions for each of the categories obtained by each of the texts are important, because a different combinations of ratios will result in texts with different textures, which will in turn be on different levels of comprehensibility. The types of cohesive elements used, that is, whether the proportion of cohesive elements used includes familiar or unfamiliar cohesive elements, had to be taken into account as they may also affect the comprehensibility of a text.

Thus a scheme may have a text whose cohesion is effected by a variety of cohesive devices. Conjunctions are responsible for 10,8% of the number of cohesive ties listed for that text. A hypothetical textbook passage compared with this scheme's text may also have 10,8% conjunctive cohesion. This one situation could be interpreted in two different ways. Either the scheme and the textbook use similar conjunctions, in which case the scheme will be evaluated as having adequately prepared the child for the textbook, or the scheme and the textbook use different conjunctions, in which case the scheme will be evaluated as not having prepared the child adequately for the textbook, even though the texture of the texts is the same.

It is in comparing each of the textbooks with each of the schemes, that the differences between the textbooks and the schemes become clear. When comparing the scores, the following deductions can be made:

a. Day-by-Day prepares its children better for the demands of cohesion in the Std 3 content subject textbooks of similar cohesive complexity to Fox than MAPEP does.

b. Day-by-Day does not seem to prepare its children better than MAPEP for the demands of cohesion in the Std 3 content subject textbooks of similar cohesive complexity to Hamlyn.

c. When comparing Day-by-Day to the two textbooks, there is almost no difference in the disparities found. Both textbooks proportionately make greater use of lexical and referential cohesion than Day-by-Day texts. This, however, might be ascribed to the length of the textbook passages analysed.

d. When comparing MAPEP to the two textbooks, there is a significant difference in the disparities between the books and the scheme. Hamlyn shows lexical cohesion disparities. It was analysed to have proportionately more same-item cohesion in both passages, more synonyms in the air passage and more superordinates in the plant passage than the MAPEP texts. Fox shows similar lexical cohesion disparities, but also was seen to use more reference (nominal, demonstrative and compar-

ative) and more causal conjunctions than the parts of the MAPEP course analysed.

e. Seen from a different point of view, the language in Hamlyn succeeds better in taking into account the linguistic cohesive proficiency the Day-by-Day or MAPEP child brings to class. Given a book such as Hamlyn, it does not seem to matter much through which language scheme the child has been taught, because there does not seem to be an undue disparity between the cohesion used in Hamlyn and the cohesion taught in either of the schemes. Given a book using cohesion of the complexity used in Fox however, Day-by-Day seems to prepare the child better for the demands which will be made on him.

If a Std 3 child cannot comprehend the cohesion of a text from a specific textbook, the comprehensibility problem is two-fold. Firstly, the textbook may be making too great a demand on the child's proficiency in cohesion. Secondly, the scheme by which the child was taught English may not have paid enough attention to cohesiveness to prepare children for the demands of the average Std 3 textbook. Should a comprehensibility problem then exist on the level of the cross-sentential matter of cohesion, the solution may lie in either changing the second language scheme used to prepare the children for Std 3 or changing the language of the textbook being used.

Both aspects should receive more attention. The language schemes written for the children should give more explicit attention to teaching 'meaning-deriving skills' of which tracing the presupposed items for cohesive elements is one. On the other hand, textbook manuscripts should be subjected to careful scrutiny. Questions such as the following must be answered: Is the text written cohesively? Are the items presupposed by cohesive devices easily retrievable? Are the cohesive devices known to the children? If they are not, is there enough linguistic support for the children to derive their meaning, or can the unknown item be replaced by one more commonly used and known?

Such questions do not only pertain to cohesive devices, but also to coherence and intrasentential aspects of the text. This issue is discussed further in Chapter 7.

5.2. COHERENCE RESULTS AND DISCUSSION

The Threshold Project conducted a test called 'Plants and Man' testing Std 3 children from two P.E.U.P. schools in Temba and one multiracial church school in Pretoria. Like the children from Phase 1 model schools of the PEUP, children from church schools are regarded as priviledged in the sense that they receive a very high

standard of education and consequently perform better in most tests. The following questions were asked:

a Do children read headings?
b Do they read labels and captions?
c Do they look at pictures if they are/are not explicitly referred to them?
d Do they know the function of pictures?
e Do they think pictures are important?
f Can they locate pictures on a page when they are referred to in the text?

One page was taken from a Std 3 science textbook, pasted onto cardboard and covered with plastic. This was called version A. Version B was a rewrite of the textbook page, changing coherence conventions such as the picture labels or captions and the manner in which pictures are referred to. Each child, who was tested individually, was asked to read either version A or B. They were told that questions would be asked about the text, but were not cued to attend to anything in particular. Both the tester and the observer watched the child closely to determine whether he/she looked at the headings, labels and pictures without reading them or whether he/she read them silently.

After a qualitative analysis was done, the following main points were extracted from the data:

a Most Std 3 children do not read headings, labels or captions. They generally also do not look at the pictures when reading, even when they are explicitly told to do so in the text. However, if a child is to be directed to a picture, the form *Look at picture 19* is more comprehensible than *See fig. 7.19. below.* Some children confessed to not knowing the meaning of the word *below* while others hesitantly read *See fig seven point one nine point below ...* followed by an embarrassed silence. The children from the P.E.U.P. schools generally did not understand that the sentence *Masked weavers are small, noisy birds (figure 7.19)* directs them to look at figure 7.19. Even 45% of the Std 3 children in the church school did not understand the pragmatic force of this sentence. From this test it can be concluded that there is a general tendency amongst the children tested not to look at pictures in a text, and that one therefore needs simple sentences explicitly directing them to do so. Teacher help will also be needed here to instruct pupils in the pragmatics of directive sentences such as those mentioned.

b Most children were able to locate the pictures referred to in the text. However, when questioned about it, it was discovered that many children chose the correct picture for the wrong reasons. The pictures were referred to as picture 19 or figure 7.19 and the picture was provided with such a caption, as well as with a short sentence in version B and a short paragraph in version A. The children had the following reasons for locating pictures:

i The text is about a bird building a nest and the picture (she chose) shows that too.
ii The reference to the picture in the text is closest to the picture the child chose.
iii References to pictures always refer downwards/upwards.
iv The first picture has a paragraph above it so it follows that subsequent pictures spoken about must be underneath the paragraph.

The children who could not locate the correct picture on the page at all seemed either not to notice the caption beneath it or could not interpret the pictures themselves.

c The questions why children did not look at the pictures and whether they regard pictures as important provided the following rich variety of often poignant answers:

i I look at the pictures because we can learn from them. It is important to look at pictures.
ii I look at the pictures because we can learn from them. It is not important to look at pictures.
iii If we look at the pictures we can see what the sparrow looks like and what colour it is (the pictures were black and white line drawings).
iv If we look at the pictures we can understand what we read.
v I must look at the pictures because they told me to. It is not important to look at the pictures.
vi It is important to look at pictures because you cannot learn about something you have not seen before.
vii We have to look at the pictures because we cannot draw them so beautifully.
viii Pictures help us to answer the questions.
ix It is important to look at the pictures (of birds) because they help us with meat.

Thus it appears that children in general do not understand the meaning of coherence aspects. It has also been suggested by Levie and Lentz that children simply do not attend to and use coherence aspects to derive meaning (Moore and Skinner 1985:47). Yet these aspects, as said before, are functional if they are used correctly. It has been shown (Reynolds and Baker 1987) that children comprehend texts better once they have been taught to attend to and use aspects such as illustrations and headings. These studies and the results of the 'Plants and Man' study, suggest that these aspects should be taught formally in the early years to make the children's reading and studying easier and more economical.

How do the two ELT schemes Day-by-Day and MAPEP contribute to learning to interpret the functions of these coherence conventions? How do the textbooks facilitate reading and learning through coherence conventions? The aspects of coherence which have been analysed will be reported and discussed in the following order:

5.2.1. The ELT schemes
5.2.2. The science textbooks
5.2.3. The disparity

By virtue of its very nature, coherence cannot be quantified in the same way as the use of cohesive devices, syntactic structures and vocabulary can. The discussion which follows will therefore be more qualitative than the previous quantitative analyses and discussions.

5.2.1. The ELT schemes: results and discussion

Neither Day-by-Day nor MAPEP teaches any coherence conventions explicitly. Some conventions, such as headings, occur in the pupils books and readers out of necessity, but their meanings and the implications they have can have are not taught to the children. The manner in which Day-by-Day uses these conventions is different from MAPEP's use of them. The two schemes will therefore be discussed separately.

Stories are organised according to story grammars, consisting of rules which describe the parts that make up a well-formed story, the way they are arranged and the relationships among them. Children seem to know these rules from a very early age, and this knowledge facilitates comprehension of other stories (Lehr 1987:550; Morrow 1982:194; Negin 1988:141). The black children in this study should not be an exception to this rule, although they may not have many books, because oral story-telling will also provide enough input to learn the rules of story grammars.

MAPEP has well-structured reading passages in the pupil's books. Additionally they provide coherence exercises in the form of short, guided compositions which are tightly structured. The Grade 2 reader contains only pictures for use in the first weeks of the year. Later these pictures are accompanied by picture labels which develop into short paragraphs written next to each picture. These picture stories display a high degree of cohesion between picture and text, even to the extent that the text alone does not make sense - it can only be understood in conjunction with the pictures. These stories develop into reading passages in Std 1 and Std 2.

The most striking aspect of these MAPEP stories is that none of them have titles, although in Std 2 stories have Reading or Extra reading as headings. Repetitive headings for exercises and questions also occur.

Day-by-Day has well-structured stories in its readers. Initially the Grade 2 reader has only pictures in it. As the year progresses, short referential paragraphs such as *This is Betty. Betty is a girl. She is a girl. This is a girl. She is Betty* accompany the

pictures. Towards the end of the year short, simple stories are written for the children.

Although these stories are well written and well structured in terms of story grammars, they do not have any headings. In Std 1 and Std 2 the stories grow progressively longer and more complex. They are also introduced by predictive headings. The headings provided for stories do not necessarily have to be reinforced immediately to be readable. A story can, for example, have a heading the meaning of which becomes clear only after the whole story has been read. An example of this type of heading can be found in the Day-by-Day Std 2 story entitled "I did not think of it". This story about a man taking his children shopping in his car seems to have no relation to the heading, until, almost at the end of the story, after having gone home by bus, the man realizes that he has forgotten his car in town. He did not think of his car because he usually goes to town by bus. This type of heading can be very effective, especially if the final interpretation provides an added dimension to the story it introduces.

Day-by-Day establishes a repetitive pattern for its readers. The child reading such a book then learns to expect a specific type of text or activity under a given heading. In Std 1 the heading Exercises occurs at irregular intervals. In the Std 2 reader every story is followed by questions under the heading Answer these questions. This repetition prepares the child for the regular pattern of information-activity-summary-test to be found in many content subject textbooks.

It thus seems that the schemes do not prepare the children for many of the coherence conventions used in expository text. The children learn the structure of a story and the structure of a narrative paragraph, but the structure of the paragraphs in a story as well as the structure of the story as a whole are not the same as that of an expository text. The schemes also may not prepare the children adequately to interpret the functions of headings and overviews in expository text.

5.2.2. The science textbooks: results and discussion

In looking at the use of coherence conventions by the schemes, four main aspects, i.e. organisation of content, organisation of paragraphs, the use of headings and the use of overviews. The following section examines the use of these conventions in the expository text of the textbook passages - how do these coherence conventions manifest themselves in expository text in Std 3?

Each aspect will be discussed separately, and in the following order:

a Organisation of content

b Organisation of paragraphs - main ideas
c Reinforced and predictive headings
d Overviews

A. ORGANISATION OF CONTENT

The way in which the content of each of the four textbook passages is organised will be evaluated separately.

The Hamlyn plant chapter is organised well, starting with parts of the plant, followed by how they grow, the soil they grow in and making cuttings as an alternative to planting seeds. Several problems were identified, however, i.e. roots and stems are not discussed as parts of the plant and the heading How plants grow (4.2) is indicated in the table of contents but has not been included in the actual chapter. This is assumed to be a careless error - the kind which should be avoided through stringent proof-reading. Another problem is that the children are asked to grow seeds and then to look at the different types of seeds, where the reverse order is more natural.

The Fox plant reproduction and growth chapter is a mixture of good and odd organisation of content. The first part of the chapter, headed Reproduction, growth and development, is organised very well and one point leads naturally to the next. Immediately thereafter is found the following odd organisation of growth and development:

The early growth of plants
How plants grow (where the plant grows quickest)
How seeds develop

The order of seeds developing, early growth and then how plants grow would be a more natural one.

A problem of a different order is found in the last section headed The places where plants grow, in other words the section on soil. However, topics like healthy and unhealthy plants and different types of fertilizers plants need to make them healthy are also discussed under this heading.

The marked difference in quality of organisation of content of the different parts of this chapter illustrates a problem which was also found when analysing another textual aspect. At times it seems as if different people wrote different parts of the text, and their different styles can be noted. This is very likely given the number of authors (six) involved in the writing of this book.

One striking difference between the plant chapters of Hamlyn and Fox is the length of the chapter. Hamlyn manages to cover the parts of the plant, the reproduction cycle, soil and cuttings in one chapter 24 pages long. Fox, on the other hand, treats the parts of the plant in a separate chapter. The chapter analysed only deals with the reproduction cycle, soil and cuttings and it cover 47

pages. This is an indication of the degree of detail with which Fox interprets the syllabus. The explicitness with which links between ideas are made clear also influences the length of the text. Hamlyn, on the other hand, is so short partly because of the problem of impoverished text which has been discussed previously.

A problem found in both plant chapters, and one probably due to the prescriptions of the syllabus, is the discussion of root hairs and the experiment to determine where the fastest growth occurs in seedlings. The syllabus expects children in Std 3 to cover these two topics when observing plant growth. However, these topics lie on a different plane of detail from the more global discussion of the growth of a seed into an adult plant. There exists an incongruence between looking at the different global stages of growth from seed to seedling to adult plant and looking at something as specific as root hairs (for which one needs a hand lens), and looking at the place of growth in a root, especially as the reasons for looking at them and their relation to the rest of the content is not made clear. The only solution to this problem seems to be a revision of the syllabus, either discarding the two specific topics or making the rest of the observations biologically more specific.

The topics discussed under the heading Air in both textbooks are reasonably well organised.

Hamlyn discusses compression and the fact that hot air rises as properties of air, but does not describe them explicitly as properties. It is possible that the word *properties* was avoided because it is an abstract notion, yet Fox uses it as a heading and describes its meaning effectively in the following short concretised passage:

> *We already know certain things about air: it is invisible, it is tasteless, it has no smell and we cannot feel it unless it moves. These things that we know about air are called the* ***properties of air.***

This passage illustrates that it is possible to translate rather complex ideas or concepts into simple language. It is of course imperative that such concepts be explained in terms of comprehensible language and familiar experience.

The only organisational problem found in the Fox chapter on the topic air is the inclusion of wind directions under the heading Effects of moving air. It would have been better if this section had been developed into an independent topic instead of discussing it under a heading where it does not fit into the line of argument.

B. MAIN IDEAS IN A PARAGRAPH

In the two Hamlyn chapters analysed there were no long expository pieces of text. Paragraphs do exist, but they are very short. The

structure of these paragraphs is generally good - they have one main idea, usually embodied in an initial topic sentence. This makes these main ideas easily retrievable, although they are not made salient through the use of italics, bold print or underlining. Good use of predictive headings also serves to introduce the main idea, aiding the reader in retrieving the appropriate schemata which will enable him to comprehend the text he is about to read.

One problem found in both chapters of Hamlyn is illustrated by the following extract:

> *A flower has different parts.*
> *The flower has a pistil and stamens.*
> *The flower has petals and sepals.*
> *The flower has a stem.*
>
> *The stem supports the flower.*
> *The sepals protect the flower before the flower opens up.*
> *The petals are pretty. Sometimes they attract insects and birds to the flower.*
> *The pistil and stamens are important for plant reproduction.*

This extract seems like a list of loosely connected or unconnected sentences about the flower. The sentences are not in paragraph form, and only two sentences follow each other directly while every other sentence starts on a new line. The relations between the sentences are not made explicit, e.g. the relation between the sentence introducing a specific part of the flower and the sentence explaining its function. The last sentence, *The pistil and stamens are important for plant reproduction* states a new concept boldly without any qualification or explanation. As a result, these sentences do not seem to constitute a coherent whole.

This extract is representative of a serious problem which sometimes occurs in this textbook, i.e. the problem of impoverished text which has implications for different levels of text comprehensibility.

By contrast, Fox has more and longer expository paragraphs which are usually well-structured. However, main ideas are not given any topographical prominence when they occur in the paragraph. Some paragraphs are problematic in that the main idea is not always salient. They also do not always occur as initial topic sentences, and sometimes they are not stated explicitly, but have to be inferred, e.g. a class project is described as follows (p.184):

> *Make a flag. You can use any old cloth to do this. Tie the flag to a straight stick with pieces of string. Put the flag up in an open space at school.*
>
> *Each day, during break, find the wind-direction by looking at the flag. Write down the date and the direction of the wind on a sheet of paper. You are now keeping record of the wind-*

direction. After a month look at your record carefully. What was the prevailing wind at your school during that month?

Only towards the end of these paragraphs does it become clear that the object of the class project is to establish the prevailing wind and not to make a flag.

C. REINFORCED AND PREDICTIVE HEADINGS

The occurrence of reinforced and predictive headings is similar for the two textbooks. About half the headings are reinforced immediately in the text following it. Reinforced headings make the text more coherent. Headings that are not reinforced are often headings for other headings, in other words headings for sections instead of texts. These headings narrow down the focus point of discussion. It is posited that this type of ordering is on a level of abstraction not applicable to Std 3 children. Instead of text such as:

EFFECTS OF MOVING AIR
The effect that wind has on soil
Things to do

I propose that headings such as these are either accompanied by short, comprehensible overviews or that the narrowing down is described in a short paragraph.

The heading Effects of moving air introduces a problem which has not been discussed yet - the syntax and the level of abstraction of headings. Headings were excluded from the intrasentential analysis of the texts. The syntactic complexity of the headings thus has not been analysed before. Neither will it be done now; the same principles as discussed in Chapter 4 are applicable here. The heading Effects of moving air will be discussed briefly as an example of the type of complexity which should be avoided. Firstly it is syntactically ambiguous as to whether someone is moving the air or whether moving is a present participle phrase functioning as an adjective. For a mature reader this may not pose any comprehension problems, but it should be kept in mind that the children this study is dealing with are immature readers trying to cope with a second language. The syntactic complexity of headings should be kept as simple as possible.

As mentioned above, about half the headings are reinforced immediately. Even more than half the headings in all four chapters are reinforced. Headings were said to be reinforced if they are followed by text about the topic predicted in the heading. Should a heading be followed by another heading it was not regarded as reinforced.

Headings are non-predictive in two ways. Firstly they are not predictive when they include words that the reader does not know. A heading such as Compression or Properties of air includes words which still have to be introduced to the children these books are

meant for. Compression is included in the glossary at the end of the chapter and the word Properties is explained immediately after it has been used in the heading. It is thus clear that the authors of these headings knew that these words were unfamiliar to their readers. If the reader does not know the meaning of the word, however, that heading cannot be predictive for that reader and should not be used as a heading. If there are no other alternatives, the meaning of the word should be explained immediately after the word has been used as a heading, as was done in Fox.

Secondly the content of the heading may simply not correspond to the content of the text following such a heading, e.g. a heading such as How plants grow followed by a discussion of monocotyledonous and dicotyledonous seeds.

It is interesting to note that the two chapters on plant reproduction have proportionately more predictive and reinforced headings than the two chapters on air. One would expect that extra care would be taken with the air chapters as the content is more abstract and more unfamiliar to the children. Yet they offer less guidance for the reader in terms of reinforced headings and of headings predictive of the content to follow.

Different combinations of reinforced and predictive headings occur in the four chapters. There are headings which are both reinforced and predictive, headings which are not reinforced but are predictive, headings which are reinforced yet are not predictive and headings which are neither reinforced nor predictive. Headings which are both reinforced and predictive or neither of the two form the two end-points of the continuum. In the middle lie headings which are not reinforced immediately but are predictive such as: Investigation: do seeds need warmth to germinate? where the text starts with the apparatus needed for the experiment and as such is not reinforced immediately,, but where the experiment will test whether seeds need warmth to germinate as predicted by the heading. Headings which are reinforced immediately but are not predictive also lie in the middle of the continuum. An example of this combination is a heading such as The life in seeds followed by the following text:

> *Seeds are like tiny sleeping plants. They lie ready to be woken up when Spring returns.*

which superficially reinforces the words seeds and the concept of life. However, the text then continues to discuss the different parts of the seed and not the life in seeds. The heading therefore is reinforced, but is not predictive of the text following it.

D. OVERVIEWS

Hamlyn does not make any use of overviews to introduce chapters or their sections.

In Fox one can find interactive sentences telling the children what is going to happen in the next section. These overviews are phrased in different ways, e.g.:

p.56: Here are three experiments ...
p.61: We must now try and find out ...
p.85: Let us try and find out more about this ...
p.88: You can find the answer from the following experiments.

These overviews introduce sections of a chapter, not a chapter as a whole. The comprehension and use of an overview of a whole chapter to structure reading and thought may be an advanced skill which cannot be expected of children in Std 3. It requires a metacognitive ability to see the chapter as a whole and keep this structure in mind throughout the reading of that chapter. The type of overview found in Fox providing several overviews of sections within a chapter, may therefore be the most appropriate at Std 3 level, because it does not require the reader to keep in mind complex organising structures. If an overview, be it of a chapter or section, is given at all, the language must be simple enough for the reader to process. Certainly an overview like the following, to be found in one of the science textbooks on the recommended list but not analysed for the purposes of this study, cannot be useful to the intended reader (Fourie et al no date:72):

> *In this chapter we will investigate some of the plants around our school.*
> *We shall try to identify plants in our environment.*
> *We shall see what plants look like and what functions the various parts of plants must perform.*

The complexity of the syntax is too high-level for the L2 Std 3 readers it is written for. It is possible that these overviews (one at the beginning of each chapter) are intended for teacher-use only, in which case they belong in the teacher's manual, not in the pupil's textbook.

The best type of overview is one which keeps the following four principles in mind: Firstly it relates the new section to work done previously, making the relationships between the two sections clear. Secondly it provides information about the text to come. In this way the overview not only enables the reader to select appropriate schemata for the text he is going to read, but it also indicates where the text belongs in terms of the overall structure of knowledge he has already built up. Thirdly the language used in the overview should be comprehensible to the target group. Lastly, if one is writing an overview for a target group of young readers, the overview should not attempt to structure a whole chapter, but rather smaller sections of a chapter. The following overview has been written as an example which could introduce investigations eight and nine in Hamlyn, in which monocotyledonous and dicotyledonous seeds are germinated:

> We have learned that there are two types of seed. The first type are monocotyledonous. The second type are dicotyledonous. We grew some turnip seeds. Now we are going to grow more seeds. We want to find out if monocotyledonous seeds and dicotyledonous seeds start to grow in the same way. We are going to do two experiments because we want to find out if monocotyledonous seeds and dicotyledonous seeds start to grow in the same way.

It has to be stressed that the use of overviews is a relatively high-order skill, and therefore difficult to use with small children. Its very nature necessitates the use of more complex language than one would like to see in L2 Primary Phase textbooks.

5.2.3. The disparity: results and discussion

It has already been noted that the ELT schemes do not prepare the children very well for the coherence conventions used in the textbooks. One could argue that it does not make a text less comprehensible if a reader does not know the function or meaning of coherence aspects such as headings, overviews, main ideas and illustrations. Not knowing may not result in incomprehension, but knowing the function and meaning of these conventions can help to make sense of an otherwise incomprehensible or confusing text. Coherence, therefore, is regarded as important because a reader without knowledge of coherence principles might follow many texts well, but in the case of difficult or confusing texts, such knowledge aids comprehension (Moore and Skinner 1985:47,52; Baumann 1984, 1986).

A second argument may be that coherence conventions do not have to be taught, because children 'pick them up'. The results of the 'Plants and Man' test and a paragraph building test done by the Threshold Project showed that this was not so. It must be remembered that most children in this study come from a book-less background or a home where books are not abundant and parents do not necessarily read bed-time stories from their children's infancy.

The schemes prepare their children to understand the structure of a story, but in order to prepare the children for the structure of expository passages also, such passages should be included in the schemes.

The schemes contain only a few short expository paragraphs during the course of three years, so the children may not be adequately prepared to understand the structure of an expository paragraph and to use this knowledge to make sense of a paragraph by locating its topic sentence or listing the main ideas.

Some of the MAPEP reading passages in the Std 2 pupil's book are expository paragraphs. However, MAPEP does not illustrate the use

and usefulness of headings, so that MAPEP children may not realise their importance in text comprehensibility. MAPEP also does not integrate the pictures into the text, thereby losing an opportunity to teach the skill of using illustrations to increase understanding of the text.

The nature of the schemes does not require an overview of whole sections or chapters. As a result of this lack of overview, the children are not taught to use the overview to form an overall mental picture of the structure of the content to follow. Finally the stories and themes covered in each unit do not have an inherent progressive order - they could be introduced almost randomly if the language used in them were not graded.

Rather than reproducing a list of those coherence aspects the schemes do not prepare the children for, the aspects which each scheme does include are summarised in Table 5.8. The coherence conventions which are used in the textbooks are also included in this table. By comparing the aspects used in the schemes with those in the textbooks the disparity on this level of textuality becomes glaringly obvious.

DAY-BY-DAY	MAPEP	TEXTBOOKS
---	picture labels	picture labels
repetitive patterns	repetitive patterns	repetitive patterns
predictive titles	predictive titles	predictive titles
---	---	one main idea per paragraph
---	---	headings reinforced
---	---	progressive structure
---	---	overviews
---	---	explicit reference to pictures

Table 5.8: Comparison of coherence conventions

What then should be done about the coherence problem? The solution is three-fold. Firstly, authors of language courses can include more coherence conventions in their schemes, teach them explicitly and let the children do coherence exercises such as paragraph building, finding topic sentences or interpreting graphical material. Secondly, the authors of textbooks can write what Baumann (1986) calls 'considerate text' - texts which are well-organised, have appropriate overviews, have predictive headings which are reinforced immediately, followed by paragraphs with salient main ideas. Thirdly teachers can contribute to the understanding and use of coherence aspects by discussing them in class and explaining their functions.

CHAPTER 6

THE RELATIVE IMPORTANCE OF FACTORS AFFECTING TEXT COMPREHENSIBILITY

From the detailed analysis of the two science textbooks in the previous chapters it has become clear that Fox and Hamlyn use language differently. The first section of this chapter will describe the differences that exist between the various linguistic aspects as manifested in the two textbooks. The second section will discuss the significance of differences in their use of linguistic resources, and the last section will try to establish the relative contribution of each aspect to overall text comprehensibility.

6.1. THE DIFFERENCES IN THE USE OF LINGUISTIC RESOURCES

The difference in the use of the cross-sentential aspects, coherence and cohesion, will be discussed before the intrasentential differences are looked at.

No vast differences in the use of coherence conventions were found. Hamlyn mostly uses initial topic sentences while Fox does not always start paragraphs with an explicitly stated main idea. Fox was also found to set out the arguments step by step, richly interpreting the syllabus and making the logical relationships between propositions clear. Hamlyn, on the other hand, uses a minimum of language to explain its concepts, thereby creating what has been called 'impoverished text' in which, for example, relationships between propositions are not always made explicit.

With regard to the use of cohesive devices, the textbooks make similar use of lexical cohesion and the grammatical devices ellipsis and substitution. Fox has a higher ratio of referential cohesion than Hamlyn, although the same type of referentially cohesive ties are used to express relationships. The main difference in the use of cohesive devices lies in their use of conjunctions. In both the plant and air passages, Fox uses more conjunctions than does Hamlyn. The Fox plant passage contains additive, adversative, causal and temporal conjunctions, while the Hamlyn plant passage contain no conjunctions at all to make relationships explicit. The Fox air passage contains several additive, causal and temporal conjunctions, while the Hamlyn air passage contains only one reverse causal conjunction, i.e. *because*.

Syntactically Fox is more complex than Hamlyn. The two passages from Fox which were analysed had more non-finite clauses either complementing or postmodifying other sentence elements; they had more finite adverbial clauses; they had more participle phrases acting as adjectival phrases; more co-ordinated phrases and more

passives. The regular expository text found in Hamlyn uses simpler syntax than that used in Fox, but the syntax used in the glossary which was analysed was on a par with that of Fox, if not more complex. The text in this glossary was characterised by incomplete sentences and appositions.

The use of Wh-clauses and yes-no questions in both textbooks is interesting and reflects the method used by the authors. Hamlyn has considerably more of these structures in the plant passage, while Fox uses these structures more than Hamlyn does in the air passage. This can be ascribed to the fact that an active, experimental method is reflected in the use of many questions which the child is expected to answer on the basis of his observations and findings.

The two textbooks use comparable numbers of vocabulary items in their air compression passages, i.e. 258 in Hamlyn; 261 in Fox. However, this does not mean that the vocabulary used in these passages is similar, because the Fox air passage contains many more items which are predicted to be unfamiliar to Std 3 children than the Hamlyn one does.

The Fox plant reproduction passage uses more vocabulary items than the Hamlyn plant passage, i.e. 238 items versus 143 items, but the percentage of words unfamiliar to Std 3 children in these passages is comparable. The relatively small number of vocabulary items used in the Hamlyn plant passage is due to its extensive use of repeated sentences in the different experiments which are described.

6.2. THE MEANING OF THESE DIFFERENCES

An analysis of the four passages according to a model such as that proposed by Williams (cf. section 2.2) which analyses linguistic aspects of texts comprehensively, would predict that Fox would be vastly less comprehensible than Hamlyn. However, results of the comprehensibility test conducted by the Threshold project (cf. section 3.3) showed that Fox was not as incomprehensible as was expected it would be, rather, it was comparable to the comprehensibility of the Hamlyn passage. On a 40 item c-test Std 3 children scored 24,95 (62,3%) for Hamlyn and 23 (57,5%) for Fox. This chapter will propose an explanation for this unexpected comprehensibility of Fox.

One possible explanation for this finding could be that the contributions the various meta-textual and textual aspects make towards the comprehensibility of a text do not all carry equal weight. In other words, these aspects are not all equally important in determining the comprehensibility of a text and can balance each other out. Using a predictive model of textual analysis which predicts the relative importance of each aspect could explain why the children found Fox more comprehensible than was expected.

6.3. THE RELATIVE IMPORTANCE OF ASPECTS

In this section the relative importance of each aspect in determining comprehensibility will be derived from the results of the analysis recorded in chapters 4 and 5. The textual aspects can be discussed in greater detail than the meta-textual ones, as the latter were not analysed in this study. However, information about the relationship between meta-textual and textual aspects in the literature will be discussed briefly.

Looking at the results of the disparity analysis, it seems that the following weighting could be assigned to the textual aspects of comprehensibility: **good coherence** - in the sense that headings are predictive and reinforced, appropriate overviews and summaries are provided, visual material is integrated into the text, main ideas are explicit and salient and the argument is well-structured - and **good cohesion** - in the sense that relationships between elements in a text are made explicit and that these relations are easily recognised and retrieved - balance a **complex syntax** which includes many syntactic structures the reader may not know and the use of **unfamiliar vocabulary** which is not explained and introduced in a way which makes its meaning clear.

To summarise, the illuminating use of the cross-sentential aspects of coherence and cohesion may balance opaque use of syntax and vocabulary, resulting in a text which is moderately comprehensible.

It has to be kept in mind that only the narrow sense of comprehensibility, the linguistic aspect, has been considered here. One of the limitations of this study is that the meta-textual aspects of the texts were not analysed, although it is proposed that there exists an interrelation between the textual and meta-textual aspects of any text. For example, one result of independent use of linguistically impoverished text such as that in Hamlyn may be the forming of deficient concepts, although such text scores high on readability ratings and is therefore regarded as highly comprehensible.

Steffensen et al (1986:79) also propose a relation between the background knowledge of a reader and his comprehension of cohesive devices. After conducting a study researching the interrelationship between background knowledge, register and cohesion, they concluded that a reader may not understand the relationship signalled by overt conjunctions if he does not possess the background knowledge required to process them.

A direct correlation between vocabulary knowledge, background knowledge and reasoning skills has also been posited (Ryder & Hughes 1985:290).

The picture that we have been able to draw as a result of a complex text analysis shows four typical profiles of possible text types, and their purported comprehensibilities relative to each other:

a WHEN a text, text A, makes use of linguistic resources in the following manner:

* complex syntax;
* unfamiliar vocabulary is not explained when introduced;
* cohesive ties are not easily retrievable and relationships are not made clear by explicit conjunctions;
* arguments are ill-structured, headings are not predictive nor reinforced, no overviews or summaries are given, main ideas are implicit and visual material is not integrated into the text;

THEN this text will be a relatively difficult text to comprehend.

b WHEN a text, text B, makes use of linguistic resources in the following manner:

* relatively simple syntax;
* familiar vocabulary items are introduced and explained in such a way that their meanings are clear;
* cohesive ties are not easily retrievable and relationships are not made clear by explicit conjunctions;
* arguments are ill-structured, headings are not predictive nor reinforced, no overviews or summaries are given, main ideas are implicit and visual material is not integrated into the text;

THEN this text will be more comprehensible than text A but less comprehensible than text C, which is described below. Text B is representative of the text found in Hamlyn.

c WHEN a text, text C, makes use of linguistic resources in the following manner:

* complex syntax;
* unfamiliar vocabulary is not explained when introduced;
* cohesive ties are easily retrievable and relationships are made clear by explicit conjunctions;
* argument is well-structured, headings are predictive and reinforced, appropriate overviews and summaries are provided, main ideas are explicit and salient and visual material is integrated into the text;

THEN this text will be more comprehensible than text A and text B. Text C is representative of the text found in Fox.

d WHEN a text, text D, makes use of linguistic resources in the following manner:

* relatively simple syntax;
* familiar vocabulary items are introduced and explained in such a way that their meanings are clear;

* cohesive ties are easily retrievable and relationships are made clear by explicit conjunctions;
* argument is well-structured, headings are predictive and reinforced, appropriate overviews and summaries are provided, main ideas are explicit and salient and visual material is integrated into the text;

THEN this text will be the most comprehensible of the four texts typified. The specimen science materials developed by the Threshold Project are an exponent of this type of text (Appendix 8).

The degree to which textual aspects are present in a text is relative, and many more text-types than the four described above are therefore possible. Texts A to D represent four stereotypical texts on a continuum of text types and they are used to predict the relative comprehensibility of various text types for young L2 children.

It must be kept in mind that the predictive guidelines to the relative significance of each aspect's role in the comprehensibility of texts A to D described above, have only taken into account the textual aspects syntax, vocabulary, coherence and cohesion. Speech acts were left out because no disparity was found and no prediction about its effect on comprehensibility could therefore be made, and the meta-textual aspects of text were left out because they have not been analysed in detail.

The weight of each textual aspect cannot be determined on the basis of the results of the disparity study only. Extensive research will be needed to determine the contribution of each aspect, textual and meta-textual, to text comprehensibility. The specific contribution of each of these aspects to the comprehensibility of a given text can only be determined for that specific text, because the degree in which the different aspects are present in a given text is relative. The different aspects are not discrete factors, they exist on a continuum.

On the basis of the predictions about comprehensibility, the ideal text for Std 3 L2 children can now be predicted. The method by which this prediction has been made possible, the disparity analysis, implies that each textbook should ideally be tailored according to the average linguistic knowledge of any target group. This point will be discussed further in Chapter 7. The ideal text, then, would have the following linguistic characteristics:

* It contains only syntactic structures which the target group can process, and new structures are introduced at suitably spaced intervals.
* Vocabulary used is familiar to the target group and unfamiliar items are introduced and explained in such a manner that their meaning becomes clear.
* Locutionary act-illocutionary force combinations which the children can interpret are used and any new indirect speech acts

are introduced in a context that makes their illocutionary force transparent.

* Cohesive elements are easily retrievable and comprehended by the target group; the referents of new devices are in the immediate linguistic environment and can easily be retrieved.
* Relationships between text elements are made explicit by conjunctions the meaning of which the target group is familiar with; new conjunctions are introduced in contexts which make transparent the logical relationships they signal.
* The argument is well-structured, headings are predictive and reinforced, appropriate overviews and summaries are provided, main ideas are explicit and salient, and visual material is integrated into the text; readers are directed explicitly to these conventions, thus facilitating comprehension.

The conclusion about the effect each aspect has on the comprehensibility of a text converts the model of textual analysis from a descriptive instrument to a predictive one. However, further intensive research is needed to refine the concept that the weight of each aspect of comprehensibility can be established and to determine the exact role that each aspect, be it meta-textual or textual, plays in the process of reading comprehension for a given text. Any such extension of the concept of relative weight of meta-textual and textual aspects falls outside the scope of the present study, because it primarily concerns itself with the linguistic disparity between texts, not with the process of reading.

When the disparity analysis was begun there was no reason to expect this finding of a counter-balancing of factors from an analytic point of view. However, by virtue of the fact that the Threshold comprehensibility test was used as an external criterion of text comprehensibility, we were able to determine that factors determining text comprehensibility do counter-balance each other. Although this was not the aim of this study, it is thought to be a significant finding, one which could be further researched.

While this counter-balancing has been well demonstrated, we assume its existence is regularly recognised by good language teachers.

CHAPTER 7

CONCLUSION AND RECOMMENDATIONS

This chapter will be divided into two main sections, i.e. conclusions about the size of the disparity between the English offered in English courses and the knowledge of English presupposed by the textbooks in Std 3 and recommendations for making that disparity smaller and more manageable. The conclusions will be divided into those about the size of the linguistic disparity between the English taught to these children up to the end of Std 2 and the English used in Std 3 content subject textbooks, and conclusions about the disparity between Std 2 and Std 3 in other, non-linguistic reading skills. The recommendations will be divided into three sections - linguistic recommendations, general educational recommendations and recommendations for the publishing process.

7.1. SIZE OF THE LINGUISTIC DISPARITY

a No disparity between the speech act-pragmatic force combinations taught by the schemes and those used in the textbooks passages was found to exist.

b The syntactic disparities which were found differ according to which textbook passage is compared to which language teaching scheme. The worst disparity found, a possible incomprehension of 60% of the sentences, exists when the Fox air passage is compared to the syntax taught by MAPEP. This disparity is regarded as serious because the child encountering such text will not be able to use it independently for study purposes. The smallest disparity, a possible incomprehension of 27% of the sentences, was found when the Hamlyn plant passage was compared to the syntax taught by Day-by-Day; although much better, this disparity is also serious. Overall comprehension of such text would depend on the distribution of the problem sentences in the text. If the child can comprehend the sentences preceding and following the problematic sentence, he may be able to deduce its meaning from contextual clues. However, if successive sentences cannot be decoded, the child may lose too much information to work out the overall meaning of the text. Such would probably be the case for the text in which 60% of the sentences pose comprehension problems to the average child.

c The disparity between the vocabulary taught up to the end of Std 2 and that used in the textbooks is high, ranging between 55,4% and 38,4% of the words which have not been taught. Whether this disparity can be bridged or not depends on how these new words are introduced and explained in the text.

The possible incomprehension of the syntax of the sentences in which the vocabulary is not known adds to the comprehension problem of the reader.

d No disparity was found to exist between the types of cohesive devices used in the Hamlyn passages and those taught by either Day-by-Day or MAPEP, while Fox reveals a disparity in conjunctive cohesion when compared with either of the schemes. Most of the logical connectives used in the two Fox passages will not have been taught by either language teaching scheme. In other words, when children having done either Day-by-Day or MAPEP read these passages, they will not comprehend the meaning of these connectives nor process the correct logical relationship between the propositions, e.g. cause-effect or chronological order. Should the text surrounding the connectives already be incomprehensible due to the syntax and/or the vocabulary, incomprehension of the logical connectives will add to the accumulated incomprehensibility of the text. Should the surrounding text be comprehensible to the reader, on the other hand, he could infer the meaning of the unknown logical connective.

Cohesive disparity also exists on a second dimension, i.e. the proportionate use of each cohesive device. Both Fox and Hamlyn make proportionately greater use of lexical and referential cohesion than the language teaching schemes do in the narrative texts which were analysed. This disparity can be ascribed to inherent differences between narrative and expository texts. Due to the discussion of one limited topic in an expository text, more lexical and referentially cohesive ties exist to create cohesive networks, whereas narratives contain a wider range of references to more characters and/or events and therefore do not create such a network of lexical and referentially cohesive ties. This disparity should not affect the comprehension of the expository texts, as the referential and cohesive ties and devices which are used are taught by both schemes.

e The disparity between the use of coherence conventions and the teaching of these may be the largest disparity, albeit not the most critical one, discovered in the analysis. Children are not taught the meaning of conventions such as headings, overviews and visual material; neither are the children taught to use these conventions to determine the global meaning of a text.

This ignorance of the conventions which structure the expository text type may lead to a serious incomprehension of the global meaning of sections and chapters and influence the formation of concepts and content schemata, which may later lead to incomprehension or distortion of other texts or sentences.

At its worst, the disparity picture becomes one of accumulated stumbling blocks to comprehension of a text when incomprehension of coherence conventions have also been added, one which will be extremely difficult to bridge. At best, lack of knowledge of coherence conventions hinders comprehension of the global mean-

ing of a text, but will not deter comprehension of the micro-structures of the text if the syntax, vocabulary and cohesion are comprehensible.

7.2. NATURE OF THE NON-LINGUISTIC DISPARITY

Apart from the change of medium from the mother-tongue to English in Std 3, with its corresponding linguistic disparity, DET Std 3 children also have to cope with other transitions in Std 3 which bring about their own disparities for the children to bridge. The most important of these transitions may well be from the use of narrative texts to the use of expository texts. This transition brings with it the need for different background knowledge, concepts and reading skills than was required of the children by their narrative reading texts up to the end of Std 2.

The Threshold Project has established that Std 3 children possess adequate background knowledge or conceptual knowledge for the processing of the plant reproduction and growth chapter in their general science curriculum (Macdonald 1988(a)). This knowledge has probably helped them to comprehend the plant passage better in the comprehensibility test also conducted by the Threshold Project, which has been used as external criterion for the interpretation of the results of the disparity analysis. It is not known whether Std 3 children possess all the required background knowledge to comprehend the air passages, but it would be expected that they do not, as these concepts are more abstract and remote from their everyday experience than those of the plant module.

The Threshold Project found that the Std 3 children when tested in their mother-tongue could cope very well with the process skills which were required for the plant reproduction and growth module. When it comes to fostering these skills in the classroom, however, two problems arise. Firstly the children have to cope with the handicap of a second language in which they may not be fluent enough to express their thinking. Secondly the classroom culture of one-word answers to questions testing recall of factual questions does not provide exercise in the use and development of process skills (Macdonald 1988(a)).

Another area of possible cause of disparity is that of reading skills. Chall (1983) proposes a model whereby reading development is classified into three stages. In the first stage the child learns to associate an arbitrary set of letters to corresponding parts of spoken words. He learns what the letters are for, in other words he learns the mechanical process of reading. In the second stage the child discovers that the spoken word consists of a finite number of sounds. He consolidates stage one learning and gains fluency and speed. While he learns to reach this stage of automaticity, the child can only read about familiar contexts and situations. In the third stage of reading the child can start to

read about unfamiliar topics with the purpose of learning from text, because the decoding process does not occupy all his processing capacity anymore. Content subject textbooks would represent stage three reading material. The child can only come to stage three if the previous stages have been reached, but this development is not the only prerequisite for reaching stage three. The child also has to know enough vocabulary, concepts and background information and reach a level of cognitive maturity before he can comprehend stage three texts (Macdonald 1988:4-5).

A lack of reading material in the environment when the child is learning to read may inhibit his reading development, causing him not to reach stage three. Before a child can comprehend content subject textbooks such as those used in Std 3, it is imperative that the child reaches the third stage of reading. A reading development deficiency, such as the failure to reach stage three, therefore has the potential to make the disparity which the Std 3 child experiences even greater than already described.

7.3. LINGUISTIC RECOMMENDATIONS

Recommendations to the authors of language teaching schemes regarding all the textual aspects will be discussed before the recommendations addressed to authors of educational textbooks are discussed.

7.3.1. Recommendations to authors of ELT schemes and content textbooks

On the basis of the syntactic analysis in section 4.2.2, it is recommended that the authors of teaching schemes should try to cover as many as possible of the following syntactic structures, because they were commonly used in the expository passages. Further analysis of more expository passages may well reveal further structures to add to this list.

a simple sentences, e.g. *The roots drink water.*
b imperatives with deleted subjects, e.g. *Put the paper in the bottle.*
c simple VP, consisting of verb or AUX + V, e.g. *swim, have planted.*
d simple NP, consisting of noun or noun + PP, e.g. *dog, dog in the box.*
e co-ordinated sentences, e.g. *Plant the bean and watch it for two weeks.*
f Wh clause, e.g *What happens to the air?*
g Yes/No question with S-AUX inversion, e.g. *Does warm air move upwards?*
h relative clause, e.g. Dogs *which have rabies are dangerous.*

i finite complement of verbgroup, e.g. The boy says *that he must go.*
j finite subject, e.g. *That the farmers have water for their animals* is important.
k finite complement of noun, e.g. Tha fact *that beans are dicotyledons* means that their cotyledons grow up above the ground.
l finite complement of adjective, e.g. he seemed angry *that he had not been chosen.*
m non-finite/finite adverbial at the beginning and/or at the end of a sentence, e.g. Hold the paper above the candle *while it is burning.*
n non-finite complement of verbgroup, e.g. He has agreed *to do his homework.*
o non-finite subject, e.g. *Running fast* makes you tired.
p non-finite complement of noun, e.g. Our asking *to be let off early* was a bad idea.
q non-finite postmodifier within NP, e.g. A book for you *to read.*
r non-finite complement of adjective, e.g. The girl is happy *to catch the bus.*
s non-finite complement of preposition, e.g. She lost her books by *leaving them on the bus.*

The authors of schemes must also take care in grading the structures they teach, so that each structure is built on the previous ones. It is recommended that they start with a simple sentence and progressively show how it can be made more complex. For example, the sentence *The man waters the flowers* could be expanded by adding an asyndetic relative clause, for example, *The man waters the flowers in the garden,* and a finite adverbial as follows, *The man waters the flowers in the garden because it is dry.*

The different locutionary act-illocutionary force combinations used in English should be covered so that children are prepared to interpret both written and spoken discourse. The different combinations which should be taught are the following:

a direct assertives, directives, commissives, expressives and declaratives
b question directives which have the force of imperative directives
c need directives which have the force of imperative directives
d question directives which have the force of commissives
e imbedded imperative directives which have the force of imperative directives
f assertives which have the force of imperative directives

The authors should know what the language-across-the-curriculum needs of the children will be in later years and use this knowledge to teach them as much of the vocabulary as possible in familiar and interesting contexts such as narratives and class discussions. Vocabulary should be introduced in thematic clusters to facilitate the forming of schemata. Palma and Myer (1988) suggest a process of oral vocabulary teaching which entails five steps, i.e. repetition

for specific purposes, passive recognition, active identification, imitation and use in novel communication. Should such a teaching method be adopted when writing content subject text, its interactive nature will result in text different from the ordinary expository text found in current textbooks.

Attention should be paid to all cohesive devices, not only to reference and lexical cohesion. The teaching of logical connectives especially should play an important part in the teaching of these devices. It is also important that the children are taught the function of the cohesive devices, that they can be used to make sense of a difficult text.

The same recommendation has to be made regarding coherence conventions, i.e. predictive and reinforced headings, the use of overviews and summaries, the structure of paragraphs and especially the use of easily retrievable and salient main ideas and the use of visual material. The children should be taught to use these conventions as well as to attend to them, so that the use of such conventions in a text can help them to determine global meaning of that text. Discussion of these conventions will also help the child to build textual schemata which will make comprehension of expository text easier (Marland 1978:165).

The specimen science materials developed by the Threshold Project incorporate this recommendation and use expository content in exercises explicitly teaching coherence conventions such as identifying and ordering main ideas (cf. Appendix 8).

Durojaiye (1974:210) criticises mother-tongue speakers of English writing textbooks for first or second language Nigerian children for not having determined a suitable level of language. The same criticism could be levelled against writers of educational textbooks for the South African context. Books written for L1 are sometimes used for L2 children without change, or these books are inadequately simplified according to mechanical readability formulae, sometimes resulting in text even less comprehensible to the L2 reader than the original text would have been (Wegerhoff 1981:21). Close contact with the target group and intimate knowledge of their linguistic and meta-textual competencies are therefore regarded as the most critical attributes any textbook writer should possess. It is of the utmost import that the textbook writer should know which structures and conventions his target group has internalised, so that these structures can be used and built upon, ensuring maximum comprehensibility.

Regarding the syntactic structures used in his text, the author should use the simplest possible ones, and keep to those he knows they can comprehend. New structures should be introduced sparingly and only when equivalent structures are not known.

He should also take cognisance of the vocabulary his target group already possesses and use familiar words in his text. When new vocabulary items have to be introduced they must be explained

clearly, making optimal use of the background knowledge the readers possess to draw analogies. When explaining terminology in several sentences, the main idea should be stated first, followed by explanatory detail sentences, e.g. *The locust hopper is partly different from the adult. The hopper hatches from the egg. The hopper does not have wings or reproductive organs.* (Rogan 1979:39).

Text which is cohesive and coherent is more comprehensible than text which is not. The textbook author must therefore write text which is cohesive, and make sure that the referents for the cohesive elements are easily retrievable. It is best to make logical relations explicit through the use of connectives. However, the author once again must use those which the children are already familiar with. If he uses connectives which have not been taught, the relationship those connectives express must be made transparant.

The author must also make use of coherence conventions to make his text easier to process, but he must be careful to use comprehensible syntax, vocabulary, cohesion and paragraph structure when writing headings, overviews and summaries etc. When giving instructions or asking questions, individual instructions and questions will avoid confusion. For example, instead of using the following sentence: *How do chickens reproduce and what happens to make sure that as many eggs as possible hatch and grow into adults?* it can be divided into the following three sentences: *How do chickens reproduce? How does the hen protect the eggs? How does the hen protect her chicks?* (Rogan 1979:39).

It is suggested that people be allowed into expository text as agents or grammatical subjects, simulating the narrative text the children are more familiar with. This may result in longer text, but will simultaneously make ideas more explicit and reduce the burden of information processing (Perera 1986:62). Perera suggests using characters such as children to interview content specialists who can explain concepts rather than expository paragraphs explaining the same content out of context.

Should the suggestions given thus far be incorporated in one textbook, it should be clear that such a text will not resemble ordinary expository textbooks as we know them. They will be more interactive by nature, requiring the children to write, answer and comment on the work in a workbook-like textbook. Such workbooks would then be personal and meaningful (Sutton 1974:44), even more so if they could be used in juxtaposition with the children's own writing on direct observation and creative interpretation (Carre 1974:81).

It has been argued that it would be more productive to teach the children to come to terms with the more difficult language of textbooks in the English class (Perera 1986:63). However, in the case of these black Std 3 children the disparities they have to cope with have become so enormous that teaching them more language alone is not feasible. The authors of the textbooks they will have to use in later years will have to contribute to the closing of the chasm.

Other recommendations which could serve to diminish the disparity between Std 2 and Std 3 will be discussed in the next section.

7.4. NON-LINGUISTIC RECOMMENDATIONS

Writers of English language teaching schemes should be au fait with the content the children will have to be able to deal with when using English as a medium, and adapt their courses to include topics which will cater for the language-across-the-curriculum needs of these children in later years. They should cover more expository topics in their narratives, thereby equipping the children with the necessary vocabulary, background schemata and concepts for coping with the content subjects from Std 3 onwards.

It has been argued that the use of bilingual education when introducing expository content which will be dealt with in later years, will maximally develop both the concepts and English proficiency during the Lower Primary phase (Macdonald 1988, Palma & Myer 1988, Saville-Troike 1984). Palma and Myer (1988) suggest that the best way to learn a language is to teach expository content through that medium, while Saville-Troike reports better concept formation when the concepts are discussed in the mother-tongue (1984:216). Macdonald enriches the concept by including the teaching of process skills. She argues that concepts and process skills should be developed in the mother tongue and the medium language. In such a curriculum design both languages should carry a rich load of across-the-curriculum learning in addition to the language-specific characteristics which should be mastered (1989:94).

Coupling characteristics of such a curriculum will also be the diversification of instruction by using more reading material and special training of teachers to cope with the new educational demands they will be faced with.

More and diverse reading material will have to be provided in order to help the children to develop rich vocabulary, background knowledge, concepts and cognitive skills. This material will complement textbook use and enhance the learning experience of the children (Overman 1987:30). It will also enable the children to develop to the third stage of reading which they have to reach in order to read to learn in Std 3 (Chall 1983).

Teachers should be trained to be aware of the special language needs of the content subjects the children will have to follow in later years, so that they can prepare the children to cope with the content subject language demands which will be made on them (Marland 1978:93). Teachers should also be trained to cope with the changes in classroom 'culture' which a more process-oriented and interactive teaching style will necessitate (Macdonald 1988).

7.5. RECOMMENDATIONS SPECIFICALLY DIRECTED TO PUBLISHERS

The importance of the contributions meta-textual and textual aspects make towards the comprehensibility of a text have been discussed in this study (cf. Figure 2.1). The meta-textual aspects of legibility, the psychological-cultural aspects and the aspects concerning the actual use of the textbook in the classroom have been discussed briefly, while the textual aspects speech acts, syntax, vocabulary, cohesion and coherence have been discussed in more detail. I believe that the insights gained during this study can best be put to use by dissemination of this information to publishers. This section will therefore propose a manner of publishing textbooks which is thought to be capable of producing textbooks which will be optimally readable to the children they are prescribed for. This method of publishing is not only for textbooks to be published for the L2 black child, but can be followed with fruitful results for any target group of an eduactional textbook.

The method of publishing to be proposed includes all the aspects of textual analysis which were included in the model to be used for analysing textbooks.

When publishers want to fill a need for a textbook in a specific area, they should compose a panel of the following specialists:

a A legibility specialist (lay-out, design etc.)

b A (cognitive) developmental psychologist

c A teacher teaching the target group and subject

d A content specialist

e A(n) (applied) linguist

The writing process will then proceed as follows:

a The content specialist, teacher and developmental psychologist reach agreement on what the children's background knowledge, cultural background and cognitive devlopmental level is.

b The content specialist writes his text.

c The draft text then goes to the linguist who edits the language to make it comprehensible without editing the content.

d The panel collaborates to check the feasibility of the draft.

e The draft goes to the legibility specialist who does the lay-out and makes sure the text is optimally legible.

f The teacher pilots the textbook draft and recommends possible changes which are incorporated if feasible.

g The textbook is published and/or submitted to a textbook selection committee.

I am aware of the cost involved in such a project, but feel that the ultimate comprehensibility of the resulting textbook is much more important if it will maximise learning in and out of the classroom from educational textbooks. The disparity between Std 2 and Std 3 (not only linguistically) is so enormous that it will be extremely difficult to cross. It is therefore of the utmost import to make as many aspects as possible easier to cope with.

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ADDENDUM 1: FURTHER ANALYSIS OF CONTENT SUBJECT TEXTBOOKS

The disparity analysis has determined the extent of the linguistic disparity between the ideal English competence of a child having taken an English (ESL) language teaching scheme from Grade 2 to Std 2 and the competence required of the child by content subject textbooks in Std 3.

An innovative model for textual analysis was developed and used to analyse two ESL schemes and two Std 3 General Science textbooks. The two ESL schemes analysed were MAPEP and Day-by-Day, which were the most fully developed English teaching packages available when the study was started in 1987. The two English Science textbooks were chosen from the results of a c-test, which showed that they were the most comprehensible of the available textbooks. One of the texts (Hamlyn et al) was clearly written with ESL readers in mind, and the other (Fox et al) was more obviously written with mother-tongue users in mind.

As a result of this disparity analysis, the linguistic problems a child with an ideal MAPEP or Day-by-Day English competence would have with each of the textbooks could be summarised. The question arose, however, whether these problems were generalisable across all Std 3 content subject textbooks. This addendum will investigate the question whether all content subject textbooks, i.e. General Science, Health Education, History and Geography textbooks for Std 3 present children with linguistic comprehension difficulties similar to those established by the disparity analysis.

This addendum will be divided into three main sections as follows:

a. Summary of the results of the original disparity analysis.

b. Results of an analysis of two Health Education, History and Geography textbooks prescribed for Std 3.

c. Discussion of comparison of the two sets of results.

The comparison of the two sets of analysis results will determine whether the comprehension difficulties posed by the Science texts are general problems to be found in all Std 3 content subject textbooks.

A. RESULTS OF ORIGINAL DISPARITY ANALYSIS

The results of the disparities analysis can best be summarised in the same terms as used for the analysis iteself, i.e.

1. Cross-sentential aspects
1.1 Coherence
1.2 Cohesion

2. Intrasentential aspects
2.1 Speech acts
2.2 Syntax
2.3 Vocabulary

1. CROSS-SENTENTIAL ASPECTS

1.1 COHERENCE

The disparity between the coherence conventions used in the textbooks and those used in the schemes is rather large, mainly because the schemes do not prepare the children for expository text conventions adequately. Day-by-Day has incorporated no expository text for the children to practise on. MAPEP has included very little, and not of the running expository text type found in the textbooks. As a result, the children are not prepared for or taught the meaning of expository structure, including predictive and reinforced headings, overviews, main ideas, illustrations or order. MAPEP does, however, use picture labels to a limited extent and Day-by-Day uses predictive headings for their stories in their readers. It is a great pity that the schemes do not prepare their children better for the coherence conventions in the Std 3 textbooks, not because a lack of knowlege about its aspects detracts from comprehension, but because knowledge of them helps the readers to make sense of an otherwise incomprehensible text (cf. section 5.2.3).

1.2 COHESION

Day-by-Day teaches the widest variety of cohesive elements when the two schemes are compared. Selective elements of reference, conjunctions, substitution and ellipsis are taught or used in Day-by-Day. MAPEP teaches and uses a different set of elements, and does not use or teach substitution at all. However, both textbooks use a greater number and variety even than Day-by-Day teaches. For example, Fox uses the pronominal possessive referential its which is not taught or used in either scheme. Fox also uses a number of additive, causal and temporal conjunctions in its two passages which the Std 3 child will not have encountered in his ESL scheme. The disparity for Hamlyn is much smaller - only one inverted causal conjunction, i.e. because is not taught (cf. sections 5.1.1.C and 5.1.2.C).

2. INTRASENTENTIAL ASPECTS

2.1 SPEECH ACTS

No disparity was found between the locutionary act-illocutionary force combinations used in the schemes and those used by the textbooks. During the three years, MAPEP and Day-by-Day indirectly teach their chil-

dren to interpret statements, directives and commissives. In fact, the schemes teach a wider variety of speech acts than is used in any of the Science texts.

2.2 SYNTAX

Different levels of syntactic disparity were determined in an attempt to indicate the complexity of the problem. Firstly the text was compared to the scheme to determine the percentage of unknown syntactic structures used in the textbook passage. Added to this was the percentage of unknown grammatical elements used in that text. Thirdly those structures which could possibly pose a comprehension problem due to the fact that they had not been repeatedly revised or because it is an inherently difficult structure were cumulatively added to the previous two. Lastly a practical adjustment was made in an attempt to indicate the reality of the children's comprehension problems. Threshold discovered with one of its tests (cf. English Language Skills Evaluation Report) that children could not all comprehend and/or use Wh-questions adequately, although they are taught and used repeatedly by both MAPEP and Day-by-Day. Thus, to indicate that the children may in fact have even bigger problems than indicated by the analysis which was used as an ideal competence basis, Wh-questions were cumulatively added to the possible problem category. The last two levels were divided into the percentages of sentences which should pose no problems, those which could possibly pose comprehension problems and a percentage of sentences with so many potential comprehension difficulties that they were categorised as serious problem sentences.

The syntactic disparity between schemes and textbooks is generally higher for MAPEP than for Day-by-Day children and for the Fox texts than for the Hamlyn passages. The biggest disparity seems to lie between the Fox air passage and MAPEP, and the lowest disparity seems to lie between the Hamlyn plant text and Day-by-Day. The results for these comparisons are given in Table 1 below:

UNKNOWN STRUCTURES	UNKNOWN ELEMENTS	POSSIBLE PROBLEMS	WH-QUESTIONS	SERIOUS PROBLEMS
Fox vs MAPEP				
20%	50%	60%	69%	31%
Hamlyn vs Day-by-Day				
5%	21%	27%	27%	10%

Table 1: Results for syntactic disparity

2.3 VOCABULARY

MAPEP teaches fewer words than Day-by-Day. In fact, MAPEP shows a much higher vocabulary disparity with all four textbook passages than Day-by-Day does. For example, Day-by-Day compared with the Hamlyn plants passage has a vocabulary disparity of 38,4%, while MAPEP compared to the same textbook passage shows a vocabulary disparity of 53,1%.

The comparison between the syntactic and vocabulary disparities is quite interesting. The combination Day-by-Day and Hamlyn plants passage was shown to have the smallest syntactic disparity, and it also has the smallest vocabulary disparity. The combination MAPEP and Fox air passage was shown to have the highest syntactic disparity and the second highest vocabulary disparity.

The fact that a text like the Fox air passage would be very demanding for a MAPEP child on both the syntax and vocabulary levels may unduly compound the comprehension problems such a child experiences.

B. RESULTS OF FURTHER ANALYSIS OF CONTENT SUBJECT TEXTBOOKS.

The results of the analysis of the Health Education, History and Geography textbooks will also be summarised in the same categories as used in the original disparities analysis.

1. CROSS-SENTENTIAL ASPECTS

1.1 COHERENCE

The coherence conventions used in the six content subject textbooks analysed for this secondary study correspond to those found in the science texts analysed for the original study, as will be shown below.

Organisation of content

Several examples of illogical ordering were found in the books looked at, such as that found in the population chapter of Geography Can Be Fun. The heading of that chapter is "The people of South Africa" and it does look at where different groups of people live in South Africa, but wildlife and its conservation is discussed in the same chapter.

An ordering problem on a different level is found in Geography in Action (see reduced copy of pp. 18, 19 below). In these two pages two definite ordering problems can be found. Firstly it is not always clear in which order the text columns have to be read; which is text and which is label? Secondly p.19 contains three maps. The text reads "Look for a region on these two maps in which the rain falls in both summer and winter." Apart from the fact that it is not clear which two of the three maps are referred to, map A is an overlay of maps B and C. It seems illogical to use a map which is the answer to the questions asked immediately below it on the same page.

3. Our Climate

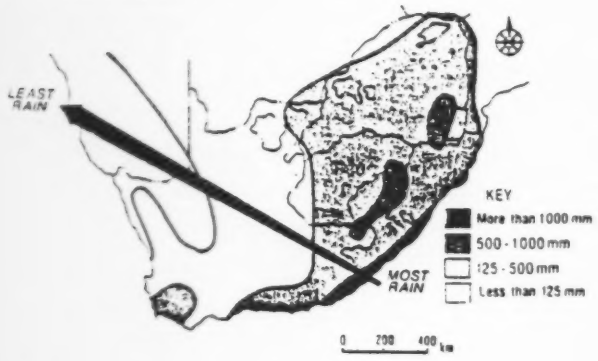
What do you think of when people talk about climate?

Did you think about how hot or how cold it is? Knowing how hot or cold the air becomes in summer and winter is an important part of understanding our climate.

Perhaps you think about rain when you think about climate. Knowing **how much** rain falls and **when** it usually falls is also an important part of understanding our climate.

Rainfall

Here is a map that shows how much rain usually falls in South Africa.



1. Look at the parts which are shaded darkly. These are the wettest parts. Look at the map key to find out how many millimetres of rain fall in these wet places.
2. The map key shows the colour used for the driest places. Which parts of South Africa are very dry, with little rain? How many millimetres of rain fall in these dry places?
3. On this map find where **you** live. Can you use the map key to find out how much rain usually falls where you live?

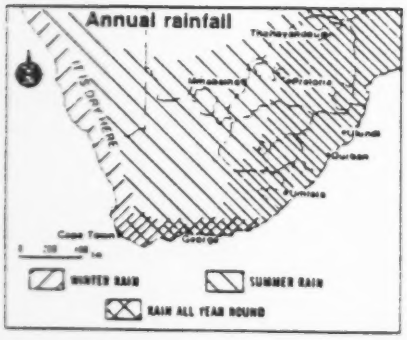
For you to do

1. Which side of South Africa receives the highest rainfall? Is it the western side or the eastern side?
2. Which of these two sentences is true?
   (a) Rainfall increases from west to east.
   (b) Rainfall increases from east to west.
3. Which of these sentences is true?
   (a) The Atlantic coast is dry.
   (b) Much rain falls in the Drakensberg.
   (c) Half of South Africa receives less than 500 millimetres of rain.

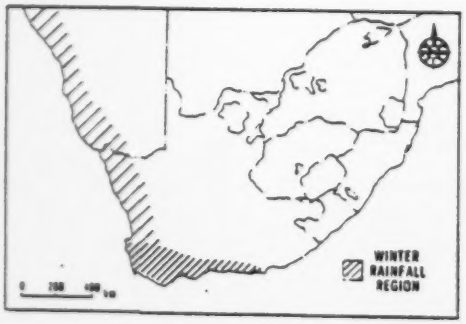
IN WHICH SEASONS DOES RAIN FALL?

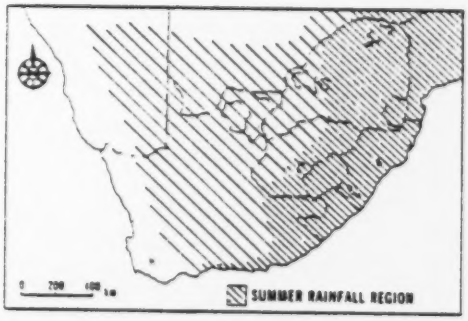
Most parts of South Africa receive their rain in **summer**.

The south-western parts of South Africa receive their rain in **winter**.



Look for a region on these two maps in which rain falls in both **summer and winter**.





We learn that there are two things to know about rainfall:

1. How much rain falls. This is measured in millimetres per year.
2. In which season the rain falls: summer or winter—or both.

For you to do

1. From the maps on this page find out in which season most rain falls in

Mmabatho	Ulundi	Thohoyandou	Cape Town
Pretoria	Umtata	Durban	George

2. Which season was most often given as the answer in question 1? Why do you think that season was named so often?
3. Find the place on the map where you live. In which season does most rain fall there?

Main ideas in a paragraph

Although most main ideas are clear, if not salient, the main ideas of some paragraphs are obscure, and have to be inferred. They also are not always contained in the first sentences of paragraphs.

Main ideas in paragraphs are mostly not made salient within the surrounding text, but are easily retrievable. However, three problems identified in the main analysis were also found in the additional texts analysed.

Some examples of impoverished text were found, e.g. p.95 in Health Education in Action:

> The kidneys
> The two kidneys remove liquid waste from the blood. They are dark red in colour and about the size of the palm of your hand.
>
> They are bean-shaped.

This exposition covers two topics in the first paragraph and adds another contained in one sentence as a second paragraph. It might be better understood if the content were re-arranged and some points embellished upon, e.g.

> Everybody has two kidneys.
>
> What does a kidney look like?
> A kidney is bean-shaped. It is as big as the palm of your hand and it is red in colour.
>
> What does a kidney do?
> Kidneys have a very important job in your body. They remove liquid waste from the blood.

Reinforced and predictive headings

Most headings are predictive, as was found in the original study. Those headings that are not predictive are so either because the vocabulary or syntactic structure used in the heading is unknown to the child, or because the content is not of the topic that was predicted by the heading. Examples of a too complex heading would be *What would happen if the earth did not rotate* (Geography can be fun, p.9) and *Colosseum* (History can be Fun, p.106). The heading *Where do people live* (Geography can be Fun p.104) is not directly predictive of the discussion of the concept of density of population which follows it.

Although most headings are reinforced, only about half the headings are reinforced immediately in the first paragraph immediately following the heading.

Overviews

The textbooks analysed contain few overviews or organisers introducing chapters or parts thereof. History can be fun (p.22) contains a rather lengthy introductory overview of the chapter. As found in the main study, however, the syntax might be too complex for the children to understand. Additionally it may be difficult for the Std 3 child to retain a framework of the whole chapter in his head. Therefore overviews of parts of chapters may be preferable, such as that found in Geography can be fun (p.3) where the children are told that they will make a weather chart to begin the topic of weather.

However, as found in the original study, overviews - of chapters or sections - are not often used. Most chapters looked at were found to lack any type of overview or advance organiser.

1.2 COHESION

Similar cohesion elements as those found in the science texts were found in the additional texts. The results of the cohesion analysis of these texts are given in Tables 2 to 5 below. These tables indicate only the types of cohesive ties found in the texts, not detailed accounts of each text's analysis.

Plural pronominal head: they
Single pronominal head: he
Single neuter pronominal head: it
Nominal possessive deictic: our
Nominal possessive deictic: your
Singular neuter pronominal possessive deictic: its
themselves
Plural nominal possessive head: them
Plural nominal possessive deictic: their
Definite article, nominal deictic: the
Singular near demonstrative, nominal deictic: this
Plural near demonstrative, nominal deictic: these
Near demonstrative, head: here
Plural far demonstrative, nominal deictic: those
Comparative deictic: so

Table 2: Types of reference found in the texts

Reversed causal: because General causal: so Simple sequential temporal: now Simple correlative: as soon as, after Emphatic adversative: however Simple conditional: if Simple additive: as well as Apposition, exemplificatory: for example, like, such as

Table 3: Types of conjunctions found in the texts

Nominal substitution for attribute: so

Table 4: Types of substitution found in the texts

Nominal ellipsis, with deictic as head Nominal ellipsis, with numerative as head Verbal ellipsis, with partial lexical ellipsis Clausal ellipsis, with total propositional ellipsis

Table 5: Types of Ellipsis found in the texts

2. INTRASENTENTIAL ASPECTS

2.1 SPEECH ACTS

The science texts, being of an interactive nature, contained many directive sentences. The History, Geography and Health Education texts, however, are not of interactive or experimental nature. They contain facts presented to the children and small sections with questions for the children to test their comprehension. As with the science texts, these contain no locutionary act-illocutionary force combinations the children have not been taught in the ESL schemes Day-by-Day and MAPEP.

2.2 SYNTAX

Syntactic analysis of the first ten sentences of each of the supplementary texts showed that the difference in disparity results for Day-by-Day and MAPEP were not as drastic as they were for the main analysis. This may be due to the limited number of sentences analysed or the type of language used in the supplementary texts. Consequently, only the results for the Day-by-Day dispartiy is given in Table 6 below. MAPEP was analysed to have four more problem sentences in all.

Because the supplementary texts are not interactive in the way that the science texts are, they do not contain the same high percentage of WH-questions. These questions were therefore left out when the syntax of the supplementary texts was analysed.

Table 6 contains four columns of data. The first column indicates the number of sentences (maximum 10) which were analysed to pose no potential comprehension problems for the Std 3 pupil having done Day-by-Day. The second column indicates the number of sentences in each text which contain structures or items which will not have been taught by Day-by-Day. The third column indicates the number of sentences in each text which might pose comprehensibility problems to the aforementioned pupils due to untaught structures and items or structures which have not been revised regularly or which are inherently difficult. Column four indicates the number of sentences which may pose serious comprehension problems.

	No problem	Untaught Structures	Possible problems	Serious Problems
Geography in Action				
Weather	2	8	8	3
Population	6	4	7	6
Geography can be Fun				
Weather	7	3	3	0
Population	4	6	6	3
History in Action				
Blacks	2	8	9	6
Romans	6	4	8	4
History can be Fun				
Blacks	8	2	10	1
Romans	7	3	4	1
Health Education in Action				
Bones	7	3	3	0
Organs	7	3	5	3
Health Education can be Fun				
Bones	7	3	4	0
Organs	7	3	6	0

Table 6: Syntactic disparity of supplementary texts

When comparing these results with the results of the syntatic disparity results of the main report, the results for the two sets of text both point to a large percenage of syntactic stumbling blocks to comprehension which confronts the Std 3 Day-by-Day or MAPEP child.

2.3 VOCABULARY

For the analysis of the vocabulary used in the supplementary texts, a sample of 100 words from each text was compared to the vocabulary taught in Day-by-Day and MAPEP. In the main study it was found that MAPEP consistently showed a greater disparity with the vocabulary of the science texts. The reason for this finding may be the fact that MAPEP did not provide a full, concise list of vocabulary taught. When the same tendency was found for the vocabulary disparity between Geography in Action and the two schemes, it was decided to use the vocabulary disparity figures for the supplementary texts and the vocabulary taught by Day-by-Day only. The results of these analyses are given in Table 7 below. The percentages given represent the percentage known or unknown (i.e. taught by Day-by-Day or not) vocabulary items per hundred words of text.

		Known	Unknown
Geography in Action	Climate	85%	15%
	Population	66%	34%
History in Action	Blacks	60%	40%
	Romans	81%	19%
Health Education in Action	Bones	61%	39%
	Organs	60%	31%
Geography can be Fun	Climate	85%	15%
	Population	77%	23%
History can be Fun	Blacks	69%	31%
	Romans	72%	28%
Health Education can be Fun	Bones	70%	30%
	Organs	65%	35%

Table 7: Vocabulary disparity between Day-by-Day and supplementary texts

No definite trends can be identified. Not one series of textbook can be said to have consistently more unfamiliar vocabulary, neither can one topic be said to intrinsically require more unfamiliar vocabulary than any other topic.

The average disparity between the vocabulary of the supplementary texts and that taught by the scheme is lower than that found in the main study. This can be attributed to the diminished size of the sample analysed. The very high vocabulary disparity found for the science texts may also have been a function of the subject-specific terminology used in these texts. The language used for Geography, History and Health Education is not so subject-specific.

Although the disparity is smaller, it is still unreasonably large.

C. DISCUSSION OF COMPARISON OF THE TWO SETS OF RESULTS

The results of the analysis of the supplementary texts show that the linguistic comprehensibility problems found to exist for the Std 3 Day-by-Day or MAPEP pupil, would exist for that child when reading any of his content subject textbooks.

The coherence conventions which were used in the science texts, were found in the supplementary texts. These will not hinder comprehension, as mentioned before, but knowledge of them could help the child to make better sense of an otherwise incomprehensible text.

As with the science texts, the supplementary texts were found to use a far greater variety of cohesive elements than is taught in either Day-by-Day or MAPEP. This means that Std 3 pupils reading these texts may not be able to identify all the antecedents for referents and substitutions, fill in all ellided phrases and clauses or comprehend the semantic relationships signalled by the different conjunctions, which may reduce their comprehension of these texts considerably.

The syntax used in the supplementary texts would, as with the science texts, compound the comprehensibility problem created by the lack of knowledge of cohesion elements. This comprehensibility problem is further aggravated by a high incidence of vocabulary items which may be unfamiliar to the child.

Should one of these types of incomprehensibility confront a reader, knowledge of the other linguistic textual aspects can still help that reader to make sense of such a text. The reader in question, however, when confronted with his Std 3 content subject textbook, is faced with such an overwhelming variety of linguistic stumbling blocks to comprehension, that these textbooks may seem completely unuseable to him as an independent learner.

On the other hand, if the text is not linguistically too complex for the child to understand, he may be faced with impoverished text which does not spell out the relationships existing between parts of the content, and which may lead to the forming of deficient concepts (cf. Health Education in Action, p.95).

The question asked at the beginning of this addendum was whether the problems which were identified to exist in the science texts could also be found in other content subject textbooks. On the basis of the analysis of the six textbooks used for this addendum, it does seem that these

problems are universally present in the content subject textbooks prescribed or recommended for the Std 3 pupils under the administration of the DET.

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APPENDIX 1: GIORDANO OPEN TEXTBOOK INVENTORY

TABLE 1
Open Textbook Inventory

Feature	Sample question	Unsuccessful	Successful
1. Table of contents	In which chapter would you find information about . . .? (Does the student turn to the index?)	—	—
2. Index	Where would you find out if a person named . . . is discussed in this book? (Does the student turn to the index?)	—	—
3. Pictorial illustrations	Why is this illustration important? (Does the student read the accompanying text?)	—	—
4. Topic sentences	If you could read only one sentence in each of these paragraphs, which sentences would you choose? (Does the student designate the initial sentences?)	—	—
5. Sources of information	Where did the authors get their information? (Does the student point to a footnote, bibliography, or list of references?)	—	—
6. Key vocabulary	Which are the important words in this passage? (Does the student identify words that are highlighted by italics, bold print, oversize type, or a comparable editing technique?)	—	—
7. Interest potential	Are there some topics in this book about which you already know anything? (Does the student point to any topics in the table of contents?)	—	—
8. Nonpictorial graphics	Where would one find what the solid line on this graph represents? (Does the student point to the graphic's key?)	—	—
9. Summaries	If you could read only a portion of this page, which portion would you choose? (Does the student select that section labeled as a *summary*?)	—	—
10. Chapter overviews	In what section of this page would one find out what was presented in this chapter? (Does the student point to the outline, set of objectives, or appropriate overview information?)	—	—

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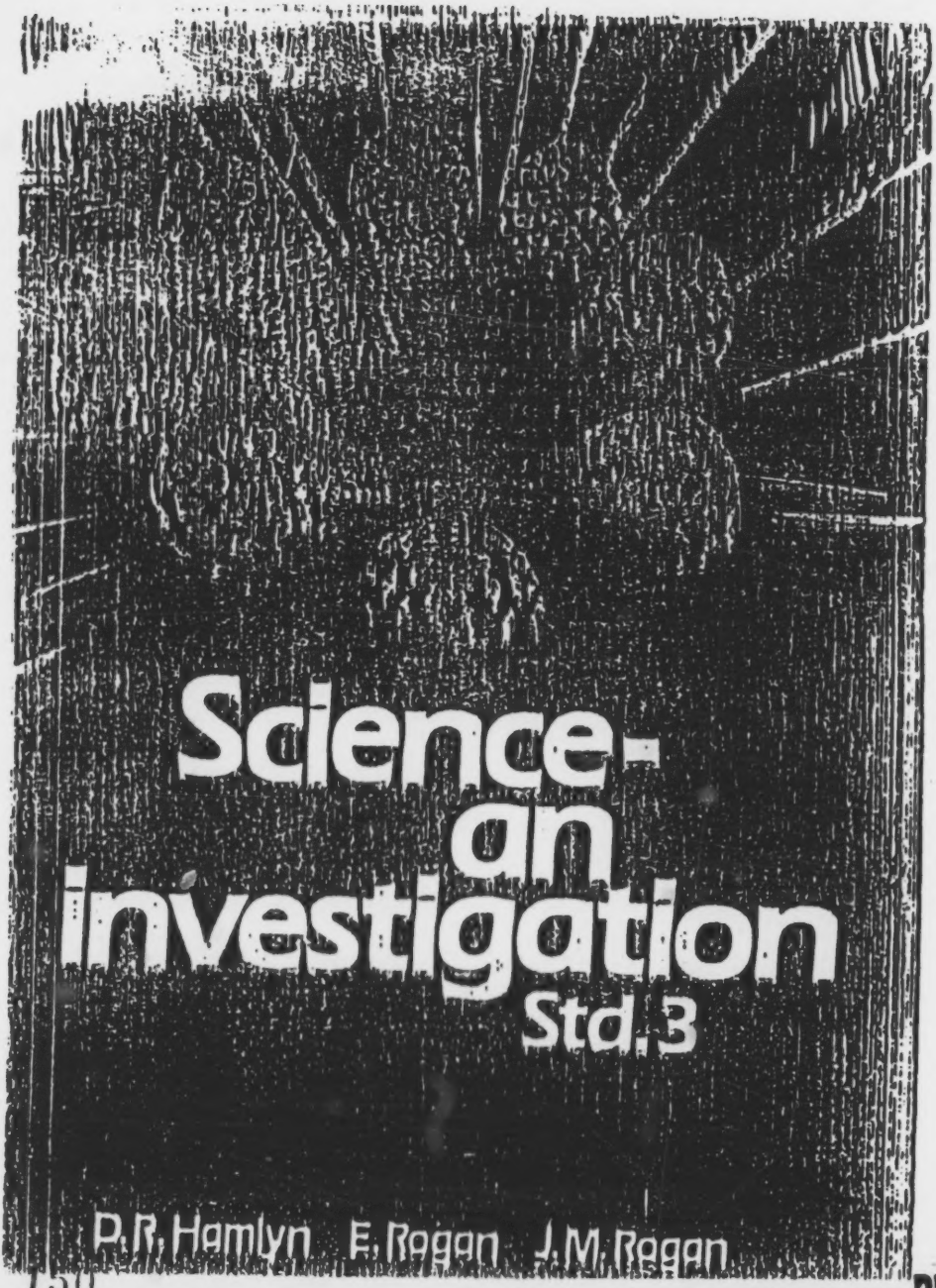

Science-
an
investigation
Std. 3
P.R. Hamlyn E. Ragan J.M. Ragan

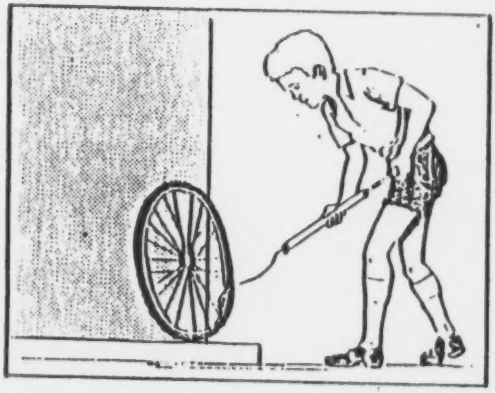
ASSIGNMENT

Try this *experiment* at home. Use different sizes of bottles.

1.6 Compression

INVESTIGATION FIVE – COMPRESSION

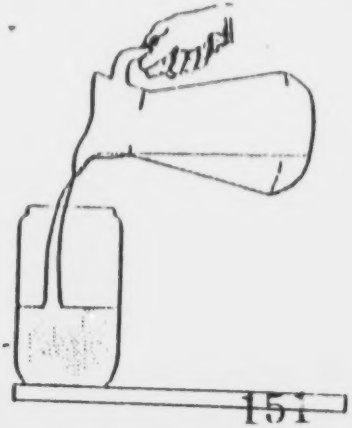
Let us see what we can do to air in a closed *space*. Look at this picture.



This boy is pumping more and more air into the same space. The tube and tyre get h a r d e r a n d harder. This is because the air is being *compressed*. (*Compressed* means squeezed together.)

ASSIGNMENT

You can do this investigation at home. Take a plastic bag or a balloon. Blow hard into the plastic bag or balloon. You are blowing air into the plastic bag or balloon. You know because the plastic bag gets harder and harder. You compress the air in the plastic bag.



You cannot compress water. Only air or other gases can be compressed.

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1.7 Hot air rises[16]

INVESTIGATION SIX – WHAT HAPPENS TO AIR WHEN IT IS HEATED?[17]

You will need:
A candle,
two blocks of wood,
a glass *chimney*, (If you don't have a glass chimney, use a cardboard tube),[18]
strips of light paper or a feather.[19]

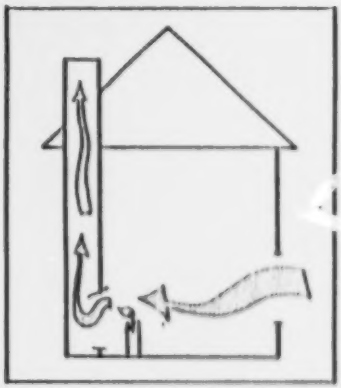
1. Fix the candle on a table.[20]
2. Place a block of wood on either side of the candle.[21]
3. Light the candle and put the glass chimney or the cardboard tube over the candle.[22]
4. Hold narrow strips of very light paper or a soft feather above the tube.[23]

What happens to the strips of paper?[24]
What makes them move upwards?[25]
The flame of the candle has made the air warm.[26]
It is the warm air rising upwards that makes them move.
Warm air rises.[27]
When air is heated it goes up.[28]
You can see this in a room with a *fireplace*.[29]

INVESTIGATION SEVEN – WARM AIR RISES

You will need:
A lighted candle and a fireplace.

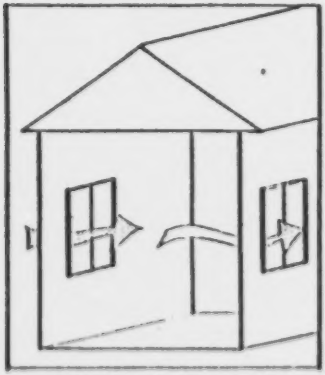
Put the lighted candle in front of the fireplace.
The hot air from the candle flame goes up the chimney.
The other air in the room moves towards the fire.
The other air in the room takes the place of the hot air, because the hot air goes up the chimney. This makes a *draught*. A draught is when the air moves a little in a room.

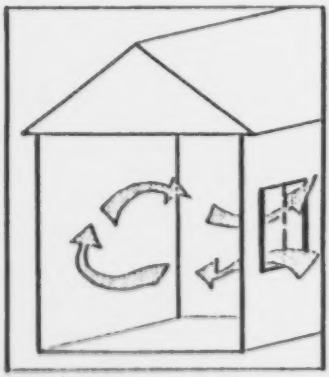


The flame of the candle moves. This shows there is a draught.

1.8 Ventilation

Our bodies need fresh air all the time – even inside rooms.
How is the air kept fresh in a house?





Cool fresh air blows into a room through doors and windows. Warm air rises and blows out through the tops of windows. Some *buildings* have *ventilation bricks*. Ventilation bricks have holes to let *fresh* air in and warm used air out of a room.

ASSIGNMENT

Look at your classroom, your home or your church and see if they let in fresh air and let out warm air.

NEW WORDS

You can read about these new words at the end of the chapter: Experiment, space, compressed, fireplace, chimney, draught, ventilation, buildings, ventilation bricks.

SUMMARY

Air fills all space.
Air can be compressed.
Hot air rises.
In your home and in your school, let warm air out.
Let cool fresh air come in.

1.9 Questions

Fill in the missing words:

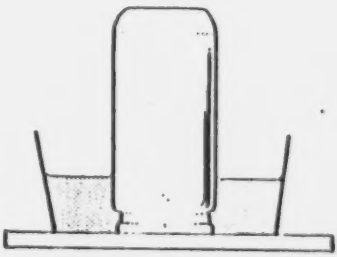
1. A ... wind can blow a roof off a building.
2. Wind that blows from the west is called a ... wind.
3. The opposite direction to north is ....
4. The opposite direction to east is ....
5. The wind collects ... when it blows over the sea.
6. When a boy pumps air into a bicycle tyre, he ... the air.
7. Warm air ...
8. ... help to ventilate a room.

Are these sentences True or False?

1. Wind is air that is moving.
2. We can use the wind to pump water.
3. Wind does not bring rain.
4. Air is only found in tyres, bottles and balloons.
5. You can compress (squeeze together) air.

Write a short sentence to answer these questions.

1. What kind of wind blows when the leaves on a tree move a little?



2. The water does not go into the bottle. Why doesn't the water go into the bottle?

NEW WORDS

Branches – The big stems which grow out of the main stem or trunk of a tree.

Breeze – A small wind.

Buildings – Places like houses, schools and factories built from bricks or wood where we can live and work.

Calm – Calm means nothing moves; it is still.

Chart – A chart is a way of writing a lot of facts in rows so that it is easy to read. Look at the chart on page 6.

Chimney – A chimney is a tall pipe built over the place where you make a fire in a room. The smoke from the fire goes up the chimney to the outside of the house.

Clothes – All the things you wear. Some clothes we know are vests, trousers, dresses and socks

Collect – Collect means to bring or take together. He collects some flowers to show his teacher.

Compass – A compass is small and round with a glass top. The directions – north, south, east, west, north-east, north-west, south-east, south-west are shown inside. A needle is fixed in the middle of these marks. The needle always points north. A compass helps people to find their way.

Compressed – Compressed means pressed together. You stand on a pile of papers. The pile of papers move closer together. You have compressed the pile of papers.

Damage – When things are broken or people and animals are hurt.

Direction – If you draw a line between two points, that line shows the direction from the one point to the other. The names of the eight directions are on page 7.

Draught – Draught means the air moves a little bit in a room.

Electricity – This is a kind of power that makes lights and stoves work, trains move and machines in factories work.

Experiment – An investigation you make in Science to test whether something is true.

Fireplace – A place that is built into the wall of a room where you can make a fire.

Fresh breeze – On page 4 fresh means a strong wind. This means that small trees will move in a fresh breeze.

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Fresh gale – A fresh gale is a very strong wind. It is stronger than a breeze. A fresh gale breaks twigs off trees.

Gale and near gale – A near gale is a strong wind. It is

stronger than a breeze but not as strong as a fresh, strong or full gale. In a near gale big trees move and it is difficult to walk.

Gentle – On page 4 gentle means a weak wind. The leaves on a tree will move a little in a gentle wind.

Grinds – Your mother grinds the mealies to make mealie-meal. Grinding is rubbing something hard until it breaks into small pieces.

Moderate – Medium. Moderate is in between hard and soft, hot and cold, high and low.

Moisture – Moisture means just a little wet.

Pattern – A pattern is something that can be copied.

Pollinate – Pollinate is when the yellow powder (pollen) on the stamen of a flower moves to another part of the flower, so that a fruit can grow.

Pumps – Pumps means to force or press water from a well or dam or from under the ground. A pump is a machine that is used to get water in this way.

Sailing boats – Little wooden boats with a long piece of wood standing up in the middle. A sail (a big piece of material) is fastened to the piece of wood. The wind blows into the sail and moves the boat over the water. Look at the picture on page 9.

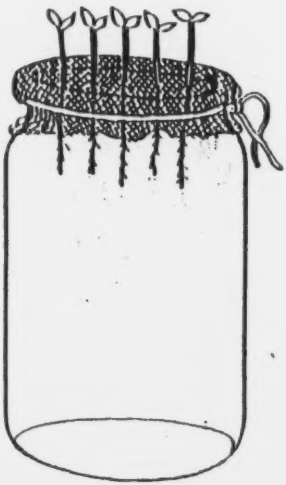
Scale – A scale is a chart where different things are measured against each other. In the Beaufort scale the different winds are measured against each other.

Scatter – Scatter means to throw or fall about in different places.

When you plant a seed, it begins to grow.
This is called *germination*.

INVESTIGATION FIVE – GROWING SOME SEEDS

You will need:
A jar,
a piece of *gauze* bandage,
water,
turnip seeds and
a piece of string.



1. Fill the jar with water.
2. Tie the gauze over the opening of the jar. (It should be covered by water.)
3. Place the turnip seeds on the gauze.
4. Put the jar in a warm place.
5. Let the seeds grow for 2 weeks.

What happens to the turnip seeds?
Which part of the plant begins to grow first?
Which part of the plant grows next?

INVESTIGATION SIX – LOOKING AT SOME SEEDS

You will need:
A bean seed,
a maize seed,
a razor blade and
water.

1. Soak a bean seed and a maize seed overnight.
2. Look at the two seeds.
3. Cut away the *seed coat* of both seeds with the razor blade. (The seed coat covers the seed and protects it.)

Do both the seeds have the same number of parts?
The bean seed has two parts. Each part is called a *cotyledon.*
We call the bean a dicotyledon. 'Di' means two.
The maize seed has one part. We call it a monocotyledon. 'Mono' means one.

ASSIGNMENT
Try this investigation again with other seeds at home. Find out if other seeds are dicotyledons or monocotyledons.

INVESTIGATION SEVEN – WHAT IS A ROOT HAIR?

Small *root hairs* on the root of a plant help the root absorb more water. Can you see a root hair?

You will need:
A germinating bean seed and a hand lens.

1. Look at the tip of a young root.
2. Does it look *fuzzy*?

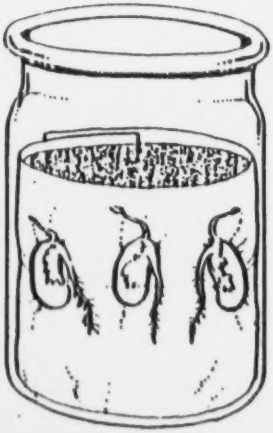
Root hairs are very small. They make the tip of a young root look fuzzy. The root hairs absorb water and *mineral salts*.

INVESTIGATION EIGHT GROW A BEAN PLANT[39]

A bean is a dicotyledon.[40]
How do dicotyledons grow?[41]

You will need:
A jar, blotting paper or a newspaper, soil, bean seeds which have been soaked overnight and water.[42]

1. Put the paper inside the jar.[43] Push the paper against the glass.[44]
2. Fill the jar with soil.[45]
3. Put the bean seeds between the jar and paper.[46]
4. Water the soil in the jar a little.[47]
5. Put the jar in a warm, dark place.[48]
6. Look at your seeds every day for two weeks.[49]
7. When the stems begin to grow, put the plants in the light.

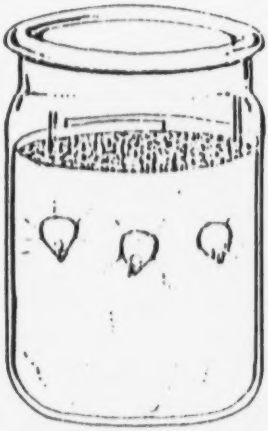


What happens to the bean seeds?
Which part of the seed grows first?
Which part of the seed grows next?
Do all the roots grow downwards?
Do all the stems grow upwards?

INVESTIGATION NINE: GROW A MAIZE PLANT

A maize plant is a monocotyledon. How do monocotyledons grow?

You will need:
A jar,
blotting paper or
a newspaper,
soil,
maize seeds which have been soaked overnight and water.



1. Put the paper inside the jar. Put the paper against the glass.
2. Fill the jar with soil.
3. Put the maize seeds between the jar and paper.
4. Water the soil in the jar.

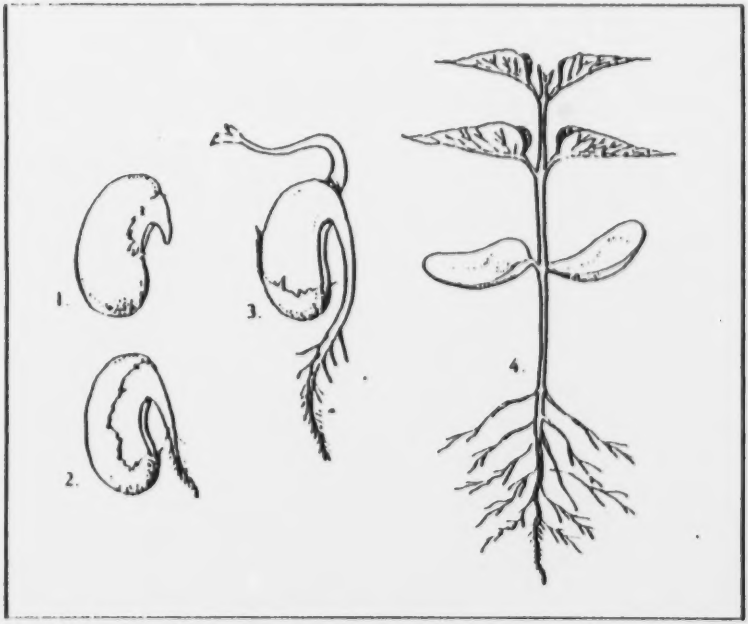
5. Put the jar in a warm, dark place.
6. Look at your seeds every day for two weeks.
7. After the stems begin to grow, put the plants in the light.

What happens to the maize seeds?
Which part of the seed grows first?
Which part of the seed grows next?
Do all the roots grow downwards?
Do all the stems grow upwards?

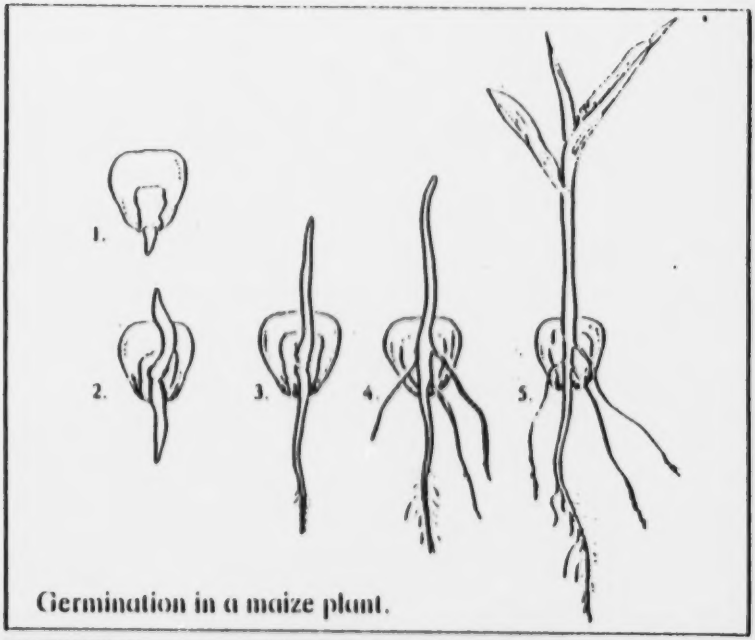
SUMMARY

When a seed begins to grow, we say it germinates.
The seed *absorbs* water.
The seed coat splits.
The main root begins to grow first. It grows downwards.
The root has tiny root hairs on it.
Then the stem begins to grow.
The stem has tiny *leaves* on it.
The leaves become green in the sunlight.

Look at the pictures.??



Germination in a bean plant.



Germination in a maize plant.

INVESTIGATION TEN – DO SEEDS NEED WATER TO GERMINATE?

When we plant seeds we want them to germinate and grow. What do seeds need to grow?

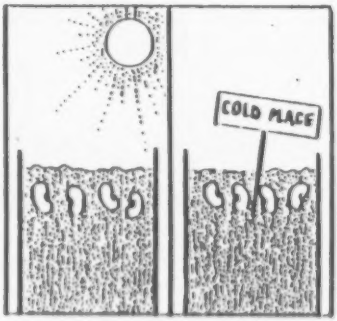
You will need: Some bean seeds, soil, two tins and water

1. Label one tin A. Label the other tin B.
2. Fill the tins with soil.
3. Plant the bean seeds.
4. Water the seeds in tin A.
5. Do not water the seeds in tin B.
6. Put both tins in a warm place.
7. Look at the tins every day for 2 weeks.

Do the seeds grow?
What happens to the seeds in tin A?
What happens to the seeds in tin B?
Do seeds need water to germinate?

INVESTIGATION ELEVEN – DO SEEDS NEED WARMTH TO GERMINATE?

You will need:
Some bean seeds,
soil,
two tins and
water.

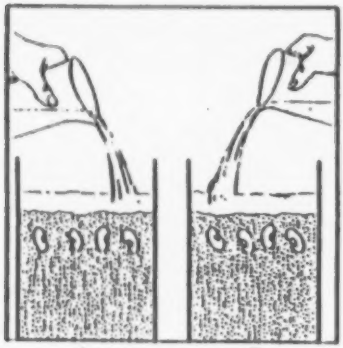


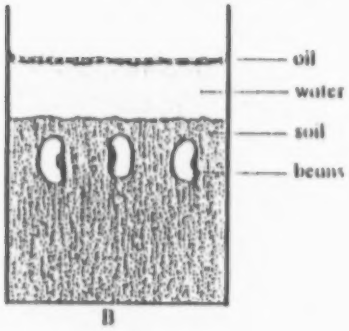
1. Label one tin A. Label the other tin B.
2. Fill the tins with soil.
3. Plant half of the bean seeds in tin A and the others in tin B.
4. Water the seeds in tin A and tin B.
5. Put tin A in a warm place.
6. Put tin B in a cold place.
7. Look at the tins every day for two weeks.

Do the seeds grow?
Which seeds germinate first?
Do seeds need warmth to germinate?

People *breathe* in air. We need air to live. If we did not have air, we would die. We would not grow. If you were under water, you could not get enough air. You would *drown*. What happens when we put seeds in water without air? Do seeds need air to grow?

INVESTIGATION TWELVE – DO SEEDS NEED AIR TO GERMINATE?





Do the seeds grow?
Do the seeds in tin A germinate?
Do the seeds in tin B germinate?
Do seeds need air to germinate?

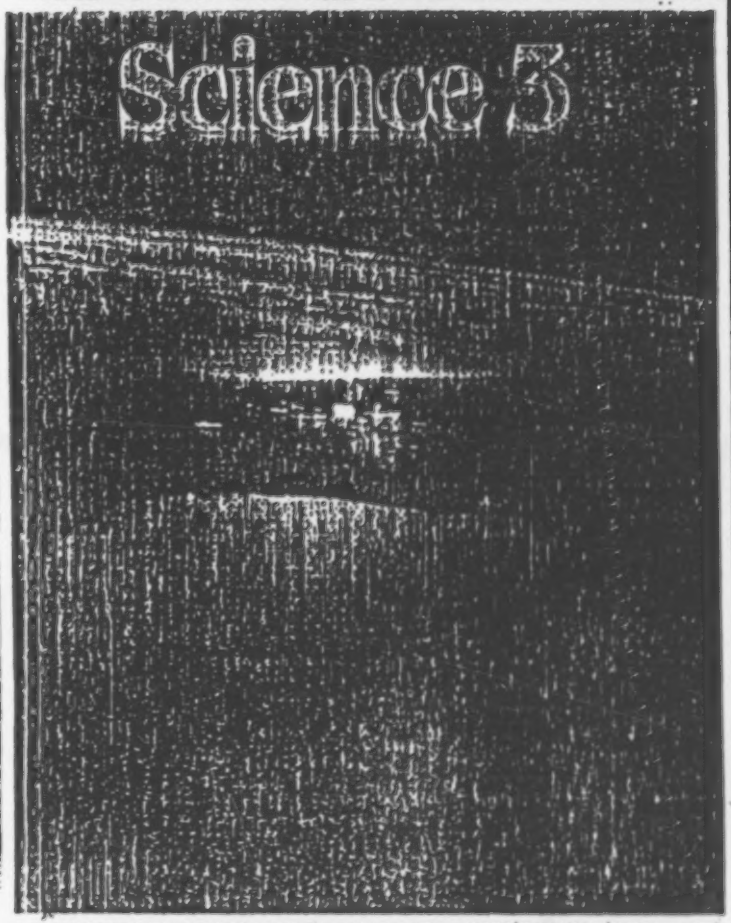
You will need:
some bean seeds,
soil,
two tins,
water and
oil.

1. Label one tin A. Label the other tin B.
2. Boil some water. Let it cool. There is no air in boiled water.
3. Fill both the tins with soil.
4. Plant half the bean seeds in tin A and the other seeds in tin B.
5. Water the seeds in tin A. Use normal water.
6. Water the seeds in tin B. Use the boiled water. Fill tin B until it is almost full of water.
7. Put some oil on top of the water in tin B. The oil stops the air from getting to the beans.
8. Look at the tins every day for two weeks.

SUMMARY
Seeds need water to germinate.
Seeds need warmth to germinate.
Seeds need air to germinate.

Department of Education and Training Catalogue number 15-240-03

Understanding



H.E. Fox L. Horn J.W.J. Opie
H.N. Pienaar P.W. Vorster S.W. Walters

New Syllabus

REPRODUCTION, GROWTH AND DEVELOPMENT

Plants, like animals and people, are living things. All living things need air, water, food and warmth to stay alive. If they do not have these things, they die.

All our food comes from plants or from animals which eat plants. It is therefore important to us that new plants are formed when old ones die. New plants grow from the seeds of the old plants.

The life in seeds

Seeds are like tiny, sleeping plants. They lie ready to be woken up when spring returns.

You have seen seeds inside apples, oranges and watermelons. We use some seeds such as peas and beans as food. Each seed is a baby plant with a supply of stored food, tightly covered by a seed-coat.

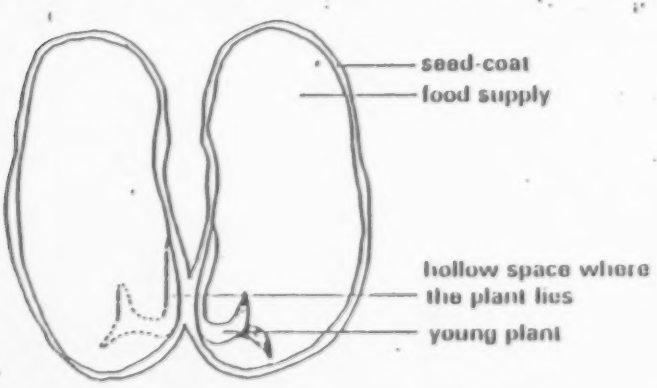


Fig. 1 The baby plant inside a bean seed

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Things to do

Find some of the kinds of seeds used as a food. Peas or beans will do.
Soak some of them in water overnight.
Now carefully peel off the softened outer coat of one seed.
Open the two halves of the seed very carefully.
How many parts can you find inside the seed-coat?
Look for the baby plant. This is the part of the seed that will grow into a new plant. Which parts contain the food stored for the baby plant?

Waking seeds up from their sleep

When you buy a packet of seeds they look lifeless but they are not really dead. In order to grow into new plants, these seeds must be woken up. This waking up is called **germination**. The seeds do not germinate in the packet. How does the waking up start?

Living things need **air**, **water** and **warmth** to stay alive. Perhaps seeds need the same things in order to germinate.

Things to do

Here are three experiments for you to do at home or in class. They will help you to find out what makes seeds germinate. You will need a packet of seeds which germinate easily. Try to get fresh radish seeds.

Do seeds need air to germinate?

1. Soak 10 seeds overnight in a jar of water.
2. Place 5 of the seeds in a jar of boiled water. Boiled water does not have air in it.

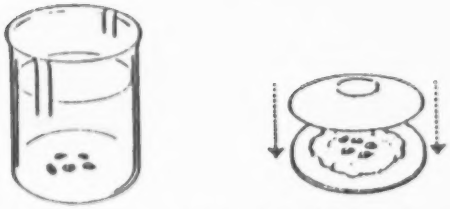

Fig. 2 To find out whether seeds will germinate without air

3. Place the other 5 seeds on a piece of damp cotton-wool between two saucers, as in Fig. 2. Air can get to these seeds.
4. Place both sets of seeds on a warm window-sill, then look at them again after about four days. Which group of seeds has germinated?

Do seeds need water to germinate?

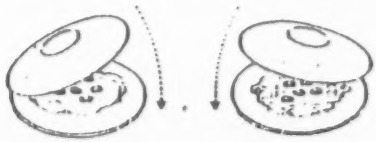

Fig. 3 To find out if the wet or the dry seeds will germinate

1. Take another 10 seeds from the packet.
2. Place 5 of them on a dry pad of cotton-wool between two saucers.
3. Place the other 5 on a damp pad of cotton-wool between two saucers.
4. Leave both pairs of saucers on a warm window-sill for about four days, then look at the seeds again.
   Which group of seeds has germinated?

Do seeds need warmth to germinate?

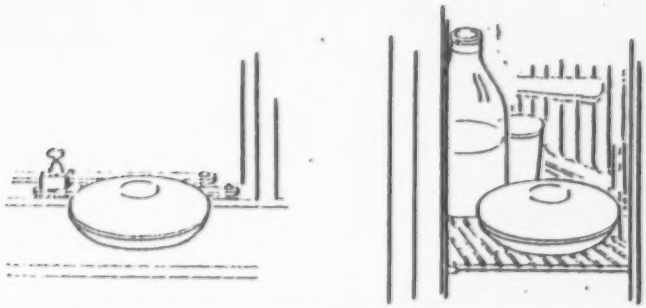

Fig. 4 To find out whether seeds will germinate in a warm or in a cold place

1. Soak 10 seeds overnight in a jar of water, then divide them into two groups of 5 each.
2. Place each group of 5 seeds on a damp pad of cotton-wool between two saucers.
3. Place one pair of saucers on a warm window-sill and the other in the refrigerator (Fig. 4).
4. Look at the two groups of seeds about four days later.
   Which group of seeds has germinated?

What do seeds need to germinate?

(a) Air. Seeds breathe very slowly but they still need air. When left under air-less water they do not germinate because they do not get enough air.
(b) Water. Dry seeds do not germinate so they must be watered after they have been planted.
(c) Warmth. The warmer months of spring and summer are the best for sowing seeds. Cold weather slows down all plant growth. It may even kill young shoots and new plants.

What is inside a seed?

When the baby plant inside the seed begins to grow it has to have the stength to push up through the soil into the sunlight. To have this strength the tiny plant needs food. Where does this come from?

The strength of seeds comes from the food in the seed. When the seeds were formed some food was stored around each baby plant. At first, this is the only food the tiny plant gets. Look at Fig. 1 again. Some seeds such as peas and beans have two supplies of food in each seed. Others such as maize and wheat have only one large supply of food. (This supply of food is also the part of the fruit or grain that we like to eat).

The two different types of seeds

The food supply inside a seed is called a **cotyledon**.

1. *Seeds with only one cotyledon.*
   Seeds such as maize, wheat and rice have only **one** cotyledon. The baby plant in the seed is almost covered by its food.
   You can make a simple model of this type of seed as shown in Fig. 5 (a). Think of your eraser (rubber) as a baby plant, then hold it in one hand. What part of the seed does your hand form?

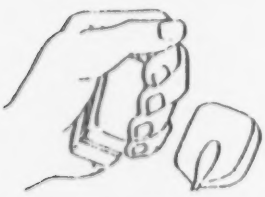

Fig. 5 (a) A seed with one cotyledon

(b) A seed with two cotyledons

2. *Seeds with two cotyledons*
Most plants have seeds with two cotyledons. The two cotyledons form slightly hollow cups on each side of the baby plant.
Make a model of a seed with two cotyledons. Hold your eraser between your two hands as in Fig. 5 (b).

Remember

1. Seeds are baby plants wrapped in their seed-coats.
2. The waking up of a seed is called germination.
3. Seeds need air, water and warmth in order to germinate.
4. Each seed has a supply of food. This is stored in the cotyledons.
5. Some kinds of seed have only one cotyledon. Maize and wheat are examples.
6. Some kinds of seed have two cotyledons. Bean and sunflower seeds are examples.

What have you learnt?

Complete the words in the following sentences:

1. A seed consists of a baby p..... and some stored f..... covered by a s.....
2. When seeds begin to grow, we say they g..... This is called g.....
3. Inside a seed there is a supply of f..... around the baby plant.
4. Seeds need this to give them s.....
5. The food supply inside a seed is called a c.....
6. Seeds have either o..... or two c.....
7. To germinate, a seed needs a....., w..... and w.....

8. Seeds do not grow well in winter because it is c. . . . . [8]
9. Examples of seeds with only one cotyledon are . . . . . and . . . . . [9]
10. Examples of seeds with two cotyledons are . . . . . and . . . . . [10]

THE EARLY GROWTH OF PLANTS

You have learnt that there are two types of seeds.[11] Collect seeds from the neighbourhood or from the kitchen and try to find out if they have one or two cotyledons. Then place them in the correct group as shown by the examples in the following table.

One cotyledon	*Two cotyledons*
Wheat	Beans
Rice	Peas
Mealies	Lupin seeds
Bird-seed (manna)	Sunflower seeds

We must now try and find out two things about the germination of seeds.

(a) What happens when the seeds **germinate**?
(b) Is there a difference in the way the two types of seeds grow?

Things to do

To find answers you will need at least 12 seeds of each type. You may choose your own seeds but here we have chosen mealie seeds and sunflower seeds. You must observe what happens to the seed under the ground and also above the ground.

3. Pull back the handle of a plastic syringe or bicycle pump fairly far.[1] What has gone into the syringe?[2] Close the front opening tightly with your finger.[3] Push in the handle.[4] See how far you can push it in without letting the air escape.[5] Let

go of the handle suddenly. What happens to the air in the syringe? Draw water into the syringe until it is full and try to push the handle in. Note that the water cannot be pressed in.

4. Take a single layer of a paper handkerchief (tissue). From it cut a strip about 5 mm wide. Pinch one end in a paper-clip or a clothes-peg and use this as a handle. Hold the strip of paper a little way above a burning candle or a strong light-bulb. Be careful that the paper does not burn.

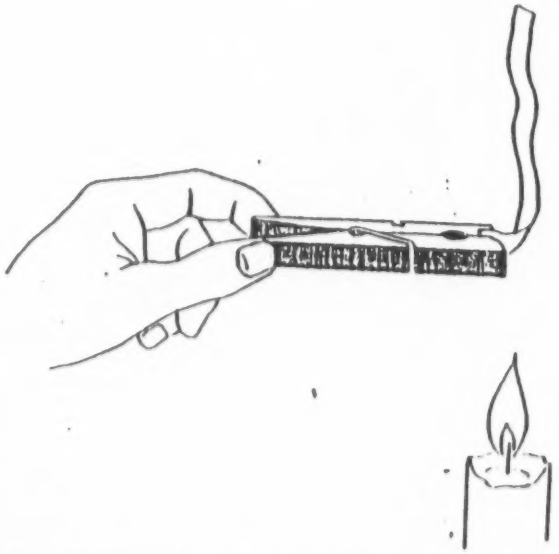

Fig. 17 What does the strip of paper show us?

5. Take a piece of the thin metal which is used to seal tins of instant coffee. Cut one of the shapes shown in Fig. 18 from the metal. Make a stand, like the one shown in Fig. 18, out of a piece of wire that has a sharp point at one end.

Place the shape you have cut out on a soft book, then use a pencil to press a small dent in its centre.

Now put the cut-out on the stand so that the dent rests on the sharp point. Place a burning candle underneath and watch what happens to the cut-out shape.

Fig. 18 What makes the little wheels turn?

We have now learnt **three** important properties of air. The pieces of paper stayed dry because there was air in the glass. Water cannot get in because air fills the space in the glass. This is the reason why air and water can change places. The water is pushed out from one glass and air takes its place.

When the handle of the syringe or bicycle pump is pushed in, the air inside does not become less. All the air is still in there. It is only pressed into a smaller space. When we let the handle go, it shoots back. We say that **air can be compressed.**

We saw that air can move a strip of paper and turn a cut-out shape like a propeller.

How does this happen?

The candle warms the air above it. This warm air rises and pushes against the strip of paper and the propeller, causing them to move.

Remember

1. Air has no colour, smell or taste.
2. Air takes up space.

3. Air can be compressed.
4. When warm air and cold air come together the cold air sinks and the warm air rises.

Air and life

Air is necessary for life. **Without air we cannot breathe.** All animals have to breathe. Plants also need air to live. If people or animals do not get enough air, they suffocate. When someone drowns, his lungs become filled with water. Water takes the place of air, so that the person cannot breathe. Can you think of other examples where people or animals die because they cannot get enough air?

People in buildings and mines must always get enough fresh air. Putting fresh air into buildings and mines is called **ventilation.**

We breathe in fresh air and breathe out used air. A person cannot live on used air. If the windows of a room are closed tightly the fresh air gets used up after a while and only the used air remains.

Things to do

1. Take a deep breath, then close your nose and mouth with your hand. Keep this up for a short time only.
   How do you feel?
   What will happen if your nose and mouth are kept closed for a very long time?
2. Breathe in. Now blow your breath against your hand.
   What kind of air did you breathe out?
   How does it feel?
3. Open one of the windows in the classroom at the top and bottom. Keep the other windows shut. Hold a piece of smouldering rope near the window-sill.

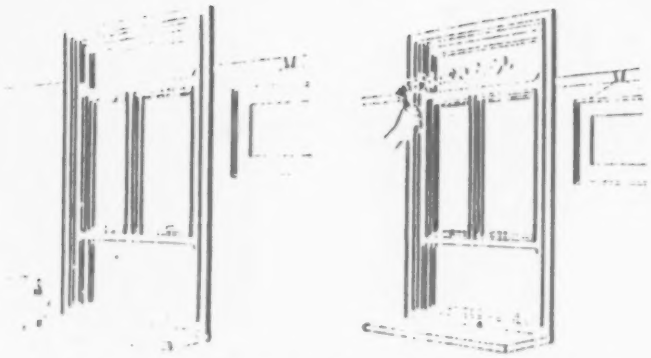

Fig. 19 To find out how air moves in the classroom

Where does the smoke move to?
What is pushing the smoke in that direction?
Where does this air come from?
Is it cool, fresh air or warm, used air?
Stand on the top of a desk and hold the smouldering rope near the top of the window.

Where does the smoke move to? Is the air that is pushing the smoke warm air or cold air?
Where does this air come from?

Make a model of a fire-place as shown in Fig. 20.
You will need a tin, a sheet of paper and a candle.
Cut openings in the side and in the top of the tin.
Roll the sheet of paper and fit it into the hole in the top of the tin. This is the chimney! Put the burning candle inside the tin below the chimney.
Hold a piece of smouldering string or cloth in front of the opening in the side of the tin.
Where does the smoke move to?
Is the air which has had a fire burning in it fresh air or used air? Is it warm air or cold air?
What will happen to the air if we make a fire in a room which does not have a chimney?

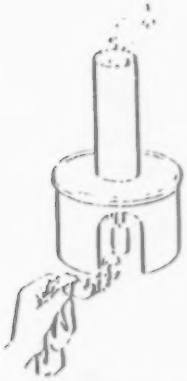

Fig. 20 Model of a fire-place

We need fresh air to live. The air which we breathe out is stale and warm. Fresh air is cool and moves in through the bottom of the window. Warm air rises and goes out at the top of the window. In this way a room gets fresh air all the time. This way of getting fresh air in through windows is called **natural ventilation.**

Air which has been used by fires is also stale. It cannot be used for breathing. Fire-places and stoves must have chimneys to take the used air and smoke away.

We cannot use natural ventilation in tall buildings and deep mines, so we use pumps to put fresh air in and take used air out. Some buildings have air-conditioners which clean the used air. They cool the air in summer and warm it in winter. This kind of ventilation that uses pumps and air-conditioners is called **artificial ventilation.** Artificial ventilation is also used in aircraft that fly very high.

Remember

1. People and animals need fresh air to live. Without fresh air they suffocate.

2. They breathe in fresh air and breathe out used air. Air in which fires have burned is used air.
3. Ventilation is needed so that rooms can get fresh air all the time.
4. In your house the warm, used air rises and escapes through the top of the windows or through the chimney. The cooler, fresh air comes in through the bottom of the windows and takes the place of the warm, used air. This is called natural ventilation.
5. Natural ventilation cannot be used in deep mines or large, tall buildings. Pumps are used to bring in fresh air and to remove the used air. This is called artificial ventilation.

What have you learnt?

Match each of the following groups of words with an explanation:

1. Air takes up space	A. Air-conditioners and pumps
2. Air can be compressed	B. A strip of paper held above a burning candle moves
3. Warm air rises	C. Windows open at the top and bottom
4. Natural ventilation	D. A piece of paper in the bottom of a glass stays dry when the glass is pushed underwater upside down
5. Artificial ventilation	E. The handle of a bicycle pump can be pushed in .

TEST YOUR KNOWLEDGE

1. Name three ways of showing that there really is air all around us.
2. Fill in the missing words:
   (a) When we say that a glass is empty there is really ..... in it.
   (b) Air can make it more difficult for us to move. We say that air offers ..... to movement.
   (c) Aeroplanes can move through air quickly and easily. They have a ..... shape.
   (d) Moving air is called .....
   (e) The speed of wind can be measured by a wind speed meter called an .....
   (f) The speed of wind can be measured in ..... or in ..... by a number on the ..... Scale.
3. Choose the correct answer from each of the following pairs.
   (a) A wind which blows dust around and moves small branches is a (light / moderate) breeze.
   (b) A (gale / hurricane) causes twigs to break off.
   (c) The number on the Beaufort Scale for calm is (0 / 6).
   (d) A wind with the strength of number (2 / 10) can blow trees over.
   (e) A flag flutters in a (gentle breeze / storm).
4. Name two things which a very strong wind can do.
5. How can wind harm farmlands?
6. Describe what we mean by wind-erosion.
7. What does wind do to the water in the soil?
8. What are wind-breaks used for?
9. How does wind harm plants?
10. How does wind help plants?
11. What causes dust-storms?
12. What is a prevailing wind? How can one tell the direction of the prevailing wind?

REPRODUCTION, GROWTH AND DEVELOPMENT

Plants, like animals and people, are living things. All living things need air, water, food and warmth to stay alive. If they do not have these things, they die.

All our food comes from plants or from animals which eat plants. It is therefore important to us that new plants are formed when old ones die. New plants grow from the seeds of the old plants.

The life in seeds

Seeds are like tiny, sleeping plants. They lie ready to be woken up when spring returns.

You have seen seeds inside apples, oranges and watermelons. We use some seeds such as peas and beans as food. Each seed is a baby plant with a supply of stored food, lightly covered by a seed-coat.

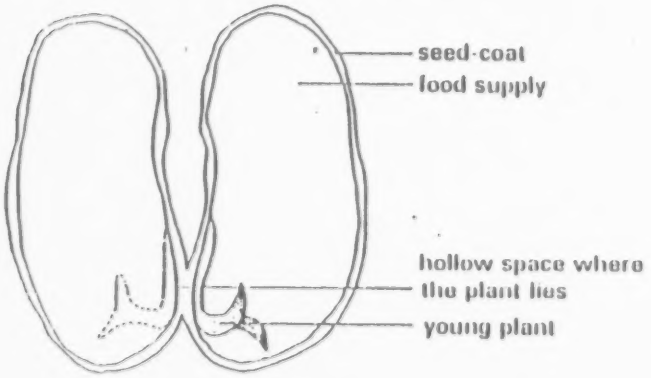

Fig. 1 The baby plant inside a bean seed

REPRODUCTION, GROWTH AND DEVELOPMENT

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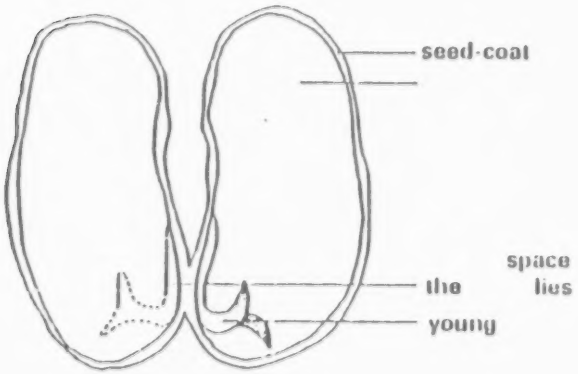

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(Jax vs MAPER)

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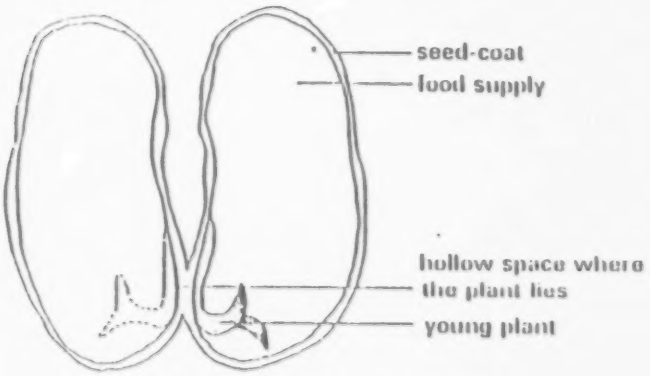

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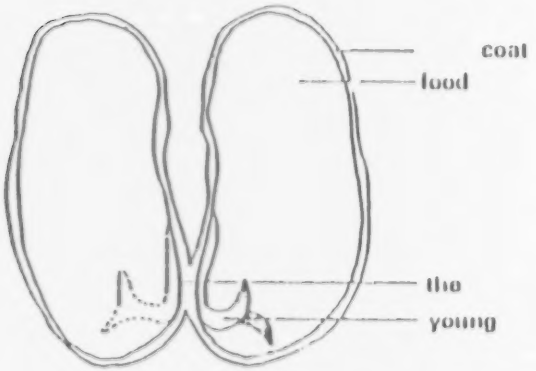

where

Fig. 1 The baby inside a bean

ASSIGNMENT

Draw a fruit. Cut it in half.
Now draw the inside of the fruit. Label the seeds.

NEW WORDS

You can read about these new words at the end of the chapter:
Absorb, anchor, reproduction, rough, smooth, simple, leaf press, label, pistil, stamens, petals, sepals, protect.

SUMMARY

There are many different kinds of plants.
Plants have different parts.
Plants have stems, leaves, roots, flowers, fruits and seeds.

When you plant a seed, it begins to grow.
This is called *germination*.

INVESTIGATION FIVE – GROWING SOME SEEDS

You will need:
A jar,
a piece of *gauze* bandage,
water,
turnip seeds and
a piece of string.

1. Fill the jar with water.
2. Tie the gauze over the opening of the jar. (It should be covered by water.)
3. Place the turnip seeds on the gauze.
4. Put the jar in a warm place.
5. Let the seeds grow for 2 weeks.

What happens to the turnip seeds?
Which part of the plant begins to grow first?
Which part of the plant grows next?

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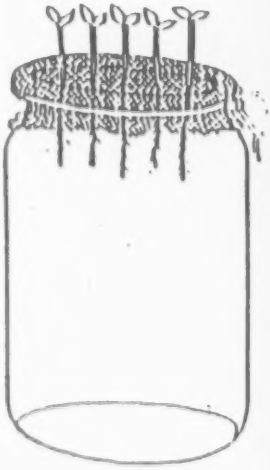

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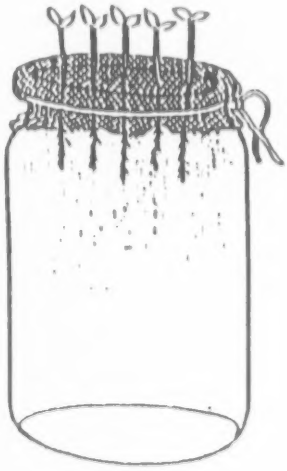

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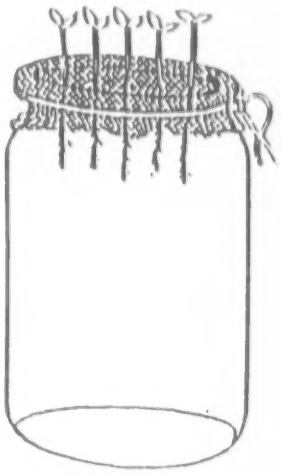

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(HAMLYN VS DAY-BY-DAY)

159

CONSTITUENTS AND FUNCTIONS (Rogan) 13:56 TUESDAY, MAY

SIN	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
A S V	1	1.0	1	1.0
A:SV S V O:SV	1	1.0	2	2.0
A:SV V O PC	1	1.0	3	3.0
A:SVO S V	1	1.0	4	4.0
A:SVO S V O:SV	1	1.0	5	5.0
S V	1	1.0	6	6.0
S V A	6	6.0	12	12.0
S V O	11	11.0	23	23.0
S V O A	2	2.0	25	25.0
S V O CO V O	1	1.0	26	26.0
S V O OP	2	2.0	28	28.0
S V O VC	1	1.0	29	29.0
S V PC	3	3.0	32	32.0
S V SP	7	7.0	39	39.0
S V SP A	1	1.0	40	40.0
S V VC	1	1.0	41	41.0
V O	5	5.0	46	46.0
V O A	4	4.0	50	50.0
V O A A A	1	1.0	51	51.0
V O A CO O A	1	1.0	52	52.0
V O OP	4	4.0	56	56.0
V O PC	18	18.0	74	74.0
V O:SVSP	1	1.0	75	75.0
V PC	3	3.0	78	78.0
V PC A	3	3.0	81	81.0
V VC:SVA	1	1.0	82	82.0
WH:A YN S V	2	2.0	84	84.0
WH:A:SV V O PC	1	1.0	85	85.0
WH:O YN S V A	1	1.0	86	86.0
WH:S V PC	3	3.0	89	89.0
WH:S V PC A	2	2.0	91	91.0
YN S V	1	1.0	92	92.0
YN S V A	4	4.0	96	96.0
YN S V O	2	2.0	98	98.0
YN S V O A	1	1.0	99	99.0
YN S V SP	1	1.0	100	100.0

An S can consist of:

15:54 TUESDAY, MAY 10, 1988 1

LINE	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
ADVP NP VP	5	3.2	5	3.2
CON	4	2.6	9	5.8
MOD NP VP	1	0.6	10	6.5
NP	24	15.5	34	21.9
NP VP	81	52.3	115	74.2
PP	1	0.6	116	74.8
S C S	1	0.6	117	75.5
S CO S	1	0.6	118	76.1
TENSE NP VP	11	7.1	129	83.2
VP	26	16.8	155	100.0

A VP can consist of:

16:36 TUESDAY, MAY 10, 1988 16

LINE	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
ADV	16	8.2	16	8.2
DM	1	0.5	17	8.7
Q	6	3.1	23	11.8
RT	3	1.5	26	13.3
S	1	0.5	27	13.8
VGPC NP NP	6	3.1	33	16.9
VGPC NP S	1	0.5	34	17.4
VGPI	26	13.3	60	30.8
VGPI C VGPI	1	0.5	61	31.3
VGPI S	6	3.1	67	34.4
VGPI VGPI	2	1.0	69	35.4
VGPI X	1	0.5	70	35.9
VGPIN AP	4	2.1	74	37.9
VGPIN NP	7	3.6	81	41.5
VGPM NP PP	20	10.3	101	51.8
VGPP PP	12	6.2	113	57.9
VGPT DET NP	1	0.5	114	58.5
VGPT NP	33	16.9	147	75.4
VGPT NP S	1	0.5	148	75.9
VGPT S	3	1.5	151	77.4
VGPT X	1	0.5	152	77.9
VP ADVP	21	10.8	173	88.7
VP ADVP PP PP	1	0.5	174	89.2
VP NP	4	2.1	178	91.3
VP PP	10	5.1	188	96.4
VP S	2	1.0	190	97.4
X	5	2.6	195	100.0

COORDINATED SUBORDINATED SYNDETIC AND ASYNDETIC 13:31 TUESDAY, DAY 10, 1980 1

111 = SYN CO OF CLAUSE
112 = SYN CO OF PHRASE
121 = SYN SUB OF CLAUSE
122 = SYN SUB OF PHRASE
211 = ASYN CO OF CLAUSE
212 = ASYN CO OF PHRASE
221 = ASYN SUB OF CLAUS
222 = ASYN SUB OF PHRAS
000 = NO CO- OR SUBORDI

SENTENCE

SENTENCE	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
000	63	63.0	63	63.0
111	6	6.0	69	69.0
112	2	2.0	71	71.0
122	8	8.0	79	79.0
122 111	1	1.0	80	80.0
122 2.2	4	4.0	84	84.0
122 222 111	1	1.0	85	85.0
122 222 222	1	1.0	86	86.0
211	3	3.0	89	89.0
211 211 111	3	3.0	92	92.0
211 211 211 111	1	1.0	93	93.0
211 211 211 211	2	2.0	95	95.0
222	5	5.0	100	100.0

SPEECH ACTS 13:50 TUESDAY, DAY 10, 1980 1

SENTENCE	FREQUENCY	PERCENT	CUMULATIVE FREQUENCY	CUMULATIVE PERCENT
ASS=ASSERTIVE	26	26.0	26	26.0
ASS-DIR IMP	7	7.0	33	33.0
DIR IMP=DIR IMP	43	43.0	76	76.0
MINI=DIR IMP	1	1.0	77	77.0
IND IMP=DIR IMP	1	1.0	78	78.0
QI-A	3	3.0	81	81.0
QUESTION=DIR IMP	19	19.0	100	100.0

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APPENDIX 5: SYNTACTIC STRUCTURES AND ELEMENTS IN TEXTBOOK PASSAGES

Structures used in Hamlyn, Rogan and Rogan: plant reproduction passage

These lists contain the syntactic structures used in the four 100-sentence textbook passages which were analysed. The numbers indicate the sentence in which the specific structure occurs. A shortened version of these lists, Table 4.3, can be found in section 4.2.2.

Non-finite verbgroup complement (group 1): 1, 11, 46, 62, 68, 71, 74, 78

Non-finite verbgroup complement (group 2): 28, 34

Non-finite adverbial: 79, 92

Finite verbgroup complement: 27 if, 68 0

Finite adverbial: 1, 46, 62, 68, 78

Subordinating conjunctions: 1 when, 27 if, 46 when, 62 after, 68 when, 78 when

Relative clause: 38 which, 54 which

Wh-questions: 10 what (S), 11 which + NOM, 12 which + NOM, 37 how, 47 what (S), 48 which + NOM, 49 which + NOM, 53 how, 63 what (S), 64 which + NOM, 65 which + NOM, 79 what (O), 90 what (S), 91 what (S)

Yes/No questions: 18 DO, 29 AUX, 32 DO, 50 DO, 57 DO, 66 DO, 67 DO, 89 DO, 92 DO

Coordinated sentences: 17 and, 97 and

Coordinated phrases: 3 and, 13 and, 14 and, 17 and, 30 and, 35 and, 42 and, 54 and, 58 and, 78 and, 80 and, 93 and, 98 and

Participle phrases - present: 30

Discourse markers: 74 then

Object complement: 21, 24, 34, 94, 95

Passive verbgroup: 2, 6, 20, 38, 54

Asyndetic coordination: 3, 13, 38, 54, 80, 93

Asyndetic subordination: 68 that

Structures used in Hamlyn, Rogan and Rogan: air compression passage

Non-finite verbgroup complement (group 1): 6, 23, 48, 57, 78, 85, 93
Non-finite verbgroup complement (group 2): 1, 21, 60, 64, 79, 84
Non-finite complement of adjective in AP: 72
Non-finite complement of preposition in PP: 72
Non-finite adverbial: 62
Finite verbgroup complement: 1 wh, 23 that, 33 wh, 35 0, 42 if,71 0,
71 0, 92 0, 97 that
Subordinate Yes/No question: 94
Finite adverbial: 5, 11, 15, 15, 25, 31, 54, 55,65, 72, 89, 90
Subordinating conjunctions: 1 what, 5 because, 11 because, 23 that,
25 when, 31 because, 33 when, 42 if,
54 when, 55 when, 65 when, 72 so that,
89 when, 90 if, 94 whether, 97 that
Relative clause: 51 that, 59 that, 68 which, 70 where, 74 where, 76 0,
77 0, 93 that, 94 0, 95 that, 95 where
Wh-questions: 20 what (S), 21 what (S), 37 how, 55 what (S), 67 why
Yes/No questions: 37 AUX, 58 verb, 67 DO
Coordinated sentences: 18 and, 42 and, 89 and, 93 and
Coordinated phrases: 3 and, 4 and, 4 or, 8 or, 9 or, 11 and, 14 or,
15 or, 18 or, 27 and, 38 and, 39 and, 39 and,
41 and, 42 or, 42 and, 47 and, 58 or, 70 and,
77 and, 78 or, 80 and, 89 and, 93 and
Participle phrases - present: 49
- past : 6, 27, 28, 89, 89
Object complement: 22
Passive verbgroup: 5, 14, 25, 45, 51, 81, 82, 95
Asyndetic coordination: 15, 42, 43, 67, 70, 77, 81
Asyndetic subordination: 15 subordinating conjunction, 35 that,
71 that, 71 that, 76 relative pronoun,
77 relative pronoun, 92 that, 94 relative
pronoun
Incomplete sentences: 6, 68, 69, 76, 89, 94, 95
Apposition: 36, 43, 63, 71, 81

Structures used in Fox et al: plant reproduction

Non-finite verbgroup complement (group 1): 8, 26, 29, 31, 58, 58, 67, 89, 100

Non-finite verbgroup complement (group 2): 29

Non-finite clause acting as subject: 23, 25, 79

Non-finite complement of adjective in AP: 8

Non-finite complement of preposition in PP: 55, 71

Non-finite adverbial: 2, 58, 59, 92, 95

Non-finite postmodifier within NP: 11, 12, 20, 78, 88

Non-finite complement of noun in NP: 28

Finite verbgroup complement: 5 that, 29 wh, 89 0, 99 that, 100 if

Finite complement of noun in NP: 63 0

Finite adverbial clause: 3, 5, 21, 22, 27, 37, 42, 51, 51, 53, 53, 58, 62, 72, 80, 89, 96

Subordinating conjunctions: 3 if, 5 that,5 when, 21 when, 22 in order to, 27 in order to, 37 then, 42 then, 51 when, 51 because, 53 so, 53 after, 58 when, 62 when, 72 then, 80 in order to, 89 when, 96 because, 99 that, 100 if

Relative clause: 4 which, 19 that, 30 which, 67 that

Wh-question: 17 how many, 20 which + NOM, 25 how, 38 which + NOM, 60 where, 73 what (O)

Yes/No questions: 17 AUX, 25 DO, 60 DO, 73 DO

Coordinated sentences: 21 but, 46 and, 50 but, 100 and

Coordinated phrases: 2 and, 4 or, 9 and, 10 and, 13 or, 26 and, 28 or, 55 and, 57 and, 65 and, 66 and, 67 or, 69 and, 80 and, 86 and, 88 and, 94 or, 95 and, 97 and, 98 and, 100 or, 100 or

Participle phrases - present: 1, 2, 7, 26

- past : 11, 15, 33, 34, 88

Discourse markers: 5 therefore, 15 now, 44 then

Passive verbgroup: 5, 22, 23, 53, 53, 62, 62, 68, 70, 79, 82, 90, 93

Asyndetic coordination: 2, 9, 26, 69, 80, 95

Asyndetic subordination: 63 that, 89 that

Apposition: 72, 46

Incomplete sentences: 49, 52, 54

Structures used in Fox et al : air compression

Non-finite verbgroup complement (group 1): 28, 44, 51, 55, 79, 6, 15
Non-finite verbgroup complement (group 2): 5, 34
Non-finite clause acting as subject: 48
Non-finite complement of preposition in PP: 5, 71, 87, 89
Non-finite adverbial: 18, 34, 42, 82, 90, 91, 96
Non-finite postmodifier within NP: 16, 17
Finite verbgroup complement: 5 wh, 9 that, 20 wh, 30 that, 31 that
Finite complement of adjective in AP: 14 that
Finite complement of noun in NP: 24 wh, 46 wh
Finite adverbial clause: 8, 19, 22, 23, 26, 29, 38, 43, 44, 45, 46, 51, 55, 81, 91, 100
Subordinating conjunctions: 8 until, 19 so that, 22 because, 23 because, 26 when, 29 when, 38 when, 43 if, 44 when, 45 so that, 46 because,51 if, 55 if, 81 if, 91 so, 100 so that
Relative clause: 15 which, 17 that, 18 0, 69 that, 79 which, 81 which, 83 which, 88 which, 92 which, 94 that, 95 that, 99 in which
Wh-question: 2 what(S), 5 how far, 7 what (S), 20 what (S), 24 why, 32 how, 46 where, 54 how, 55 what (S), 58 which + NOM, 59 how, 63 where, 64 what (S), 65 where, 68 where, 70 where, 78 where, 81 what (S)
Yes/No questions: 32 DO, 46 AUX, 54 DO, 58 DO, 59 DO, 63 DO, 65 DO, 66 verb, 68 DO, 69 verb, 70 DO, 78 DO, 80 verb
Coordinated sentences: 8 and, 12 and, 20 and, 25 and, 38 and, 51 and, 67 and, 74 and, 91 and
Coordinated phrases: 1 or, 24 and, 26 or, 31 and, 34 and, 34 and, 35 or, 38 and, 43 or, 47 and, 48 and, 49 and, 52 and, 55 and, 60 and, 66 or, 69 or, 72 and, 73 and, 77 or, 79 or, 80 or, 83 and, 84 and, 85 and, 90 and, 90 and, 93 and, 94 and, 96 and, 98 and, 98 and

Participle phrases - present: 20, 62, 67, 76, 77

- past : 31, 49, 50, 51, 66, 79, 90, 92, 98, 99

Discourse markers: 18 then, 19 now, 52 then, 57 now, 86 in this way

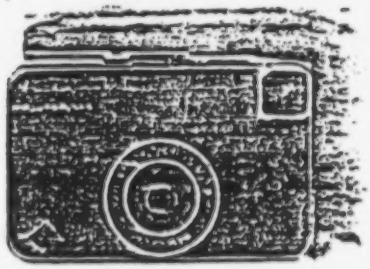
Passive verbgroup: 9, 15, 25, 26, 30, 37, 48, 51, 55, 87, 88, 94, 95, 100

Asyndetic coordination: 35, 72

Asyndetic subordination: 18 relative pronoun

Apposition: 10

Taking photographs



The next day Mr Tema showed Benny and Betty how to take photographs.[2]

Here is a picture of one of the cameras.[3]

First Mr Tema showed them the button on top of the camera.[4] He said, "When you press that you take a photograph."[5]

Then he showed them the little window at the top of the camera.[6] When they looked in the window they saw a small picture.[7] Mr Tema said, "The window shows you what your photograph will be like.[8] What you see in that window will be in your photograph."[9]

Then he opened the camera and showed them how to put the film inside.[10]

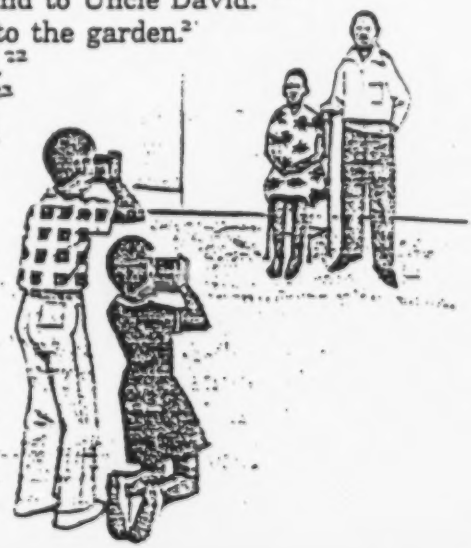
"Now," said Mr Tema, "you can take twelve photographs with your film.[11] At the end of the film we'll take the film out of the camera.[12] Then we'll take it to a photographer's shop.[13] They'll make photographs from the film."[14]

"Taking photographs is easy," said Benny.[15]

"We'll see," said his father.[16] "You must have a good picture in your window.[17] You must press the button when you see a good picture.[18] We'll see if you can do that."[19]

Betty said, "First we must take a photograph of Father and Mother to send to Uncle David."[20]

Benny carried a chair into the garden.[21] Mrs Tema sat on the chair.[22] Mr Tema stood next to her.[23] Benny and Betty each took a photograph.[24] After that they took more photographs.[25]



Then Mr Tema took the films to the photographer's shop.

See Unit 33, Lesson 7 in the Teacher's Guide.

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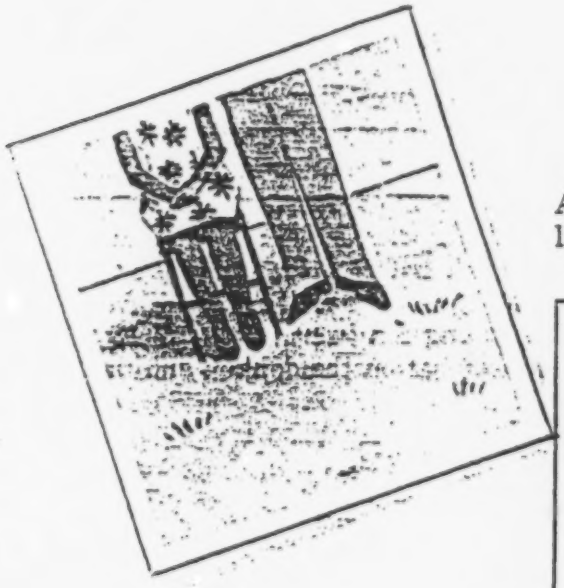
After a week Mr Tema came home from work. He said, "I've got your photographs." He was laughing.

Benny asked, "Are they good photographs?"

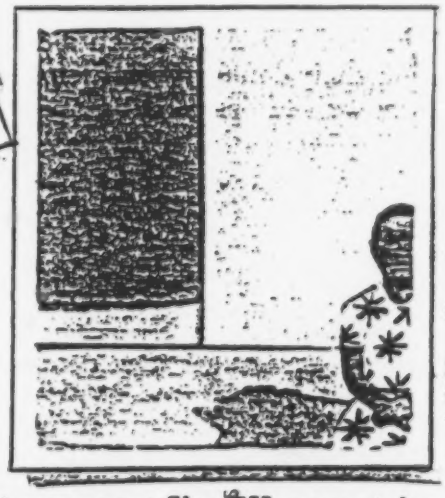
"Some are very good," said Mr Tema. "I like the photograph of Mother and me."

"Let me look! Let me look!" said Betty.

Mr Tema gave the children the photographs. Some of the pictures were very good. But Benny's photograph of Mother and Father looked like this.



And Betty's photograph looked like this.



Benny was not pleased. He said, "We can't send these to Uncle David."

"No," said his father. "But I've got some new films. You can take our photographs again."

"I think cameras are silly," said Benny. "I think that drawing pictures is best."

His mother smiled at him. "Nothing pleases everyone," she said. "Tonight I'll tell you a story about that."

Put the right words in. Make true sentences.

1. This is how you press / take / make a photograph.
2. First you put a film / photograph / picture into the camera.
3. Then you look in the button / window / film at the top of the camera.
4. What you see in that window will be in your camera / photographer / photograph.
5. Next you press the button at one side of / at the top of / inside the camera.

---

photographer press the button

Nothing pleases everyone

Once upon a time a man and his young son went to town.[2] They took their donkey with them.[3] The son sat on the donkey and the man walked beside it.[4]

They met some people on the road.[5] They heard one man say to another, "Look at that boy![6] He rides on the donkey and his poor old father walks![7] What a bad, lazy boy!"[8]

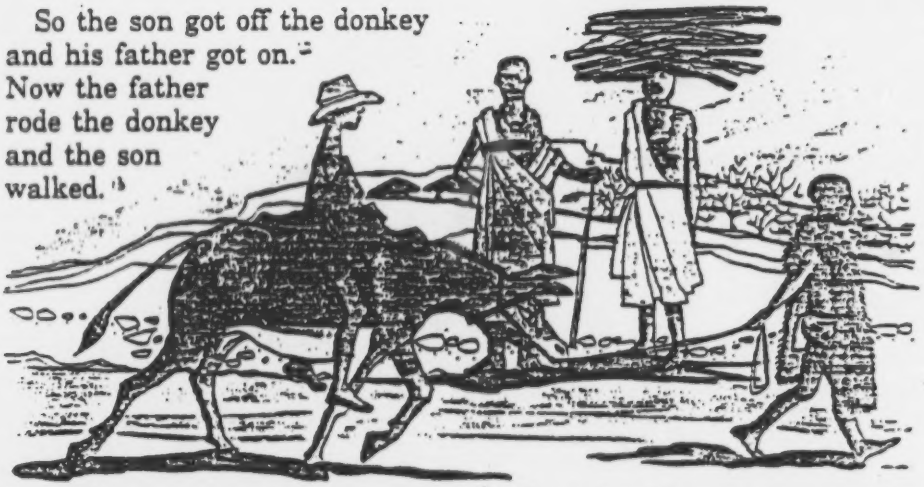
The son and his father looked at each other.[9]

"Did you hear what they said?" said the son.[10]

"Yes, I did," said his father.[11]

See Unit 33, Lesson 7 and Unit 34, Lesson 2 (for "Nothing pleases everyone") in the Teacher's Guide.

So the son got off the donkey and his father got on.[18] Now the father rode the donkey and the son walked.[19]



Soon they met some more people.[20] They heard one man say to another, "Look at that bad man![21] He rides on a donkey and his poor little son must walk.[22] What a bad man!"[23]

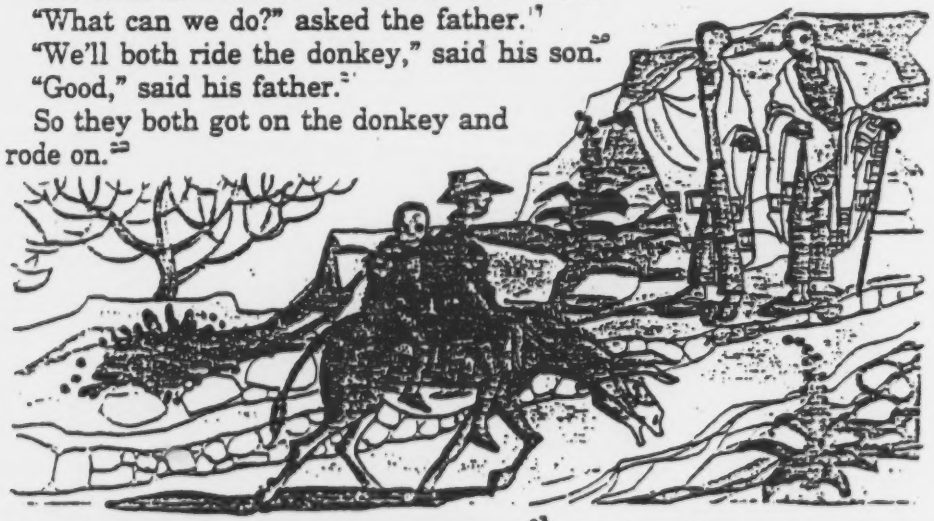
The man and his son looked at each other.[24]

"What can we do?" asked the father.[25]

"We'll both ride the donkey," said his son.[26]

"Good," said his father.[27]

So they both got on the donkey and rode on.[28]



Well, soon they met some more people.[29] They heard one man say to another. "Look at that poor donkey![30] Just look at the poor animal![31] And look at that bad man and his bad son![32] Two big people like that riding on a little donkey![33] Eh![34] What bad people!"[35]

"How can you please these people?" said the son. "*I* mustn't ride the donkey.[36] *You* mustn't ride the donkey.[37] *We* mustn't ride the donkey.[38] What can we do?"[39]

Extra reading

One day an ostrich found a little rabbit. It picked up the rabbit in its mouth. A hyena saw the rabbit. It wanted to eat it. The hyena said, 'Good morning, Mrs Ostrich. How are you?' But the ostrich didn't move or speak. It held the rabbit in its beak.

The hyena said, 'You are a beautiful bird. Your neck is long and beautiful. Stretch it out and I will see it better.' But the ostrich didn't move. It didn't speak. It held the rabbit in its beak.

Then the hyena said, 'Your legs are long and beautiful. Dance round and round. I will see them better.' But the ostrich didn't move or speak. It held the rabbit in its beak.

Then the hyena said, 'Let me see your beautiful wings. Open them and flap them up and down so that I can see them better.' But the ostrich didn't move or speak. It held the rabbit in its beak.

Then the hyena said . . . . .

What did the hyena say? What happened? Write your answers in your exercise book.

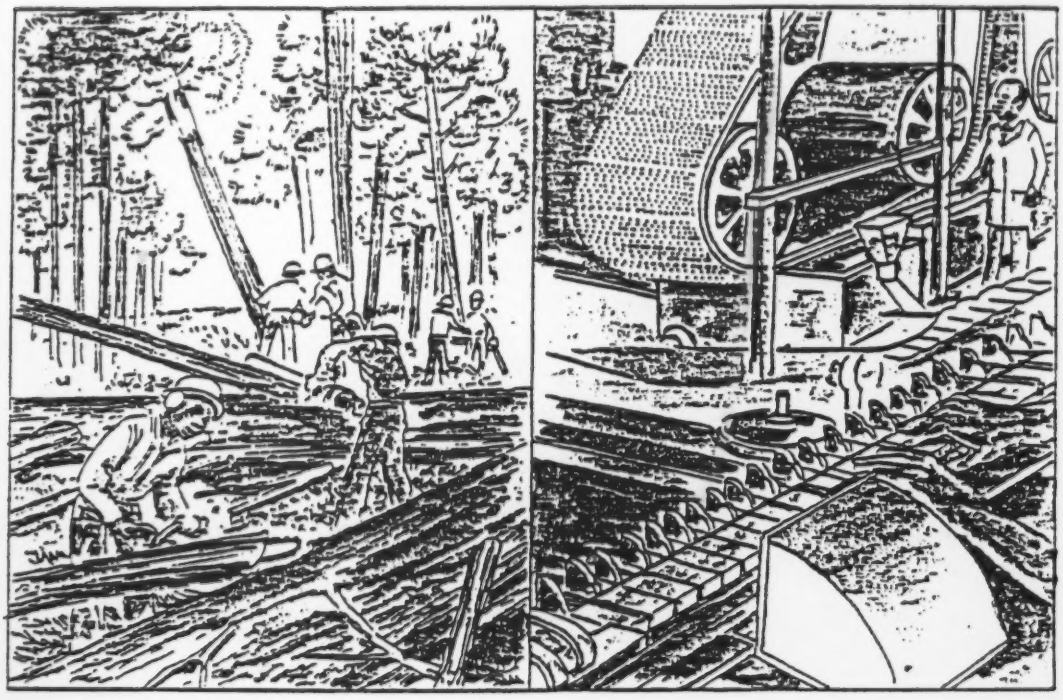
meal stove matchbox rub

Read.

Look at the woman in the picture.[32] She is cooking a meal.[33] The meal is in the pot and the pot is on the stove.[34] She has got a matchbox in her hand.[35] She is going to take out a match and rub it on the side of the matchbox.[36] The match will light and the woman will light the stove.[37] Then she will cook the meal.[38]

1 Answer the questions.

a What is the woman doing?
b Where is the pot?
c What has the woman got in her hand?
d What will happen when she rubs the match on the side of the box?
e Will the woman cook the meal then?



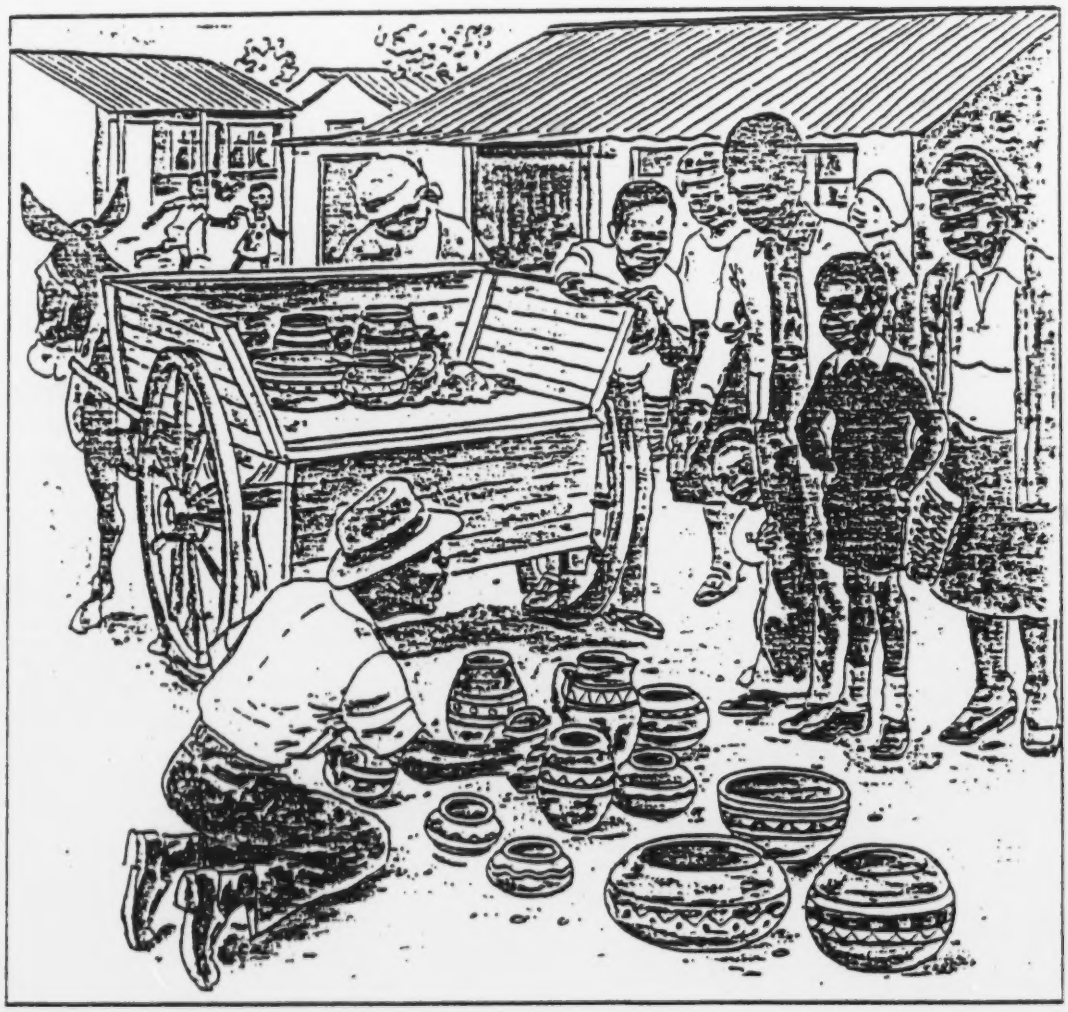
straight rough

Read.

Do you know how people make matches? The matches in the woman's box are made from big, tall trees. The trunks of these trees are straight. Men cut down the trees. Then they cut off the little branches and take the long, straight trunks to a match factory. In the match factory, some machines cut the big trees into small sticks. They put a black head on the sticks. Then other machines make the matchboxes. They stick some rough black paper on the side of the boxes. Then they fill the matchboxes with matches.

2 Answer the questions.

a Do we make matches from trees or plants?
b Are the trunks of these trees straight or bent?
c Where do the men take the trunks?
d What do the machines in the factory put on the match sticks?
e What do they stick on the side of the boxes?



Reading test

One day a man came to Isaac's village.[49] He didn't live in the village.[50] He visited the village. The man was a trader.[52] He sold pots and baskets.[53] Sometimes he rode a bicycle.[54] Sometimes he had got a donkey and a cart.[55] He often came to the village in June and July but he always came in November.[56] He never came in December.[57] In December he went back to his village.[58]

His pots had patterns on them and his baskets were black and orange.[59] The people in the village liked the trader and they always bought some of his things.[60]

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Listening comprehension

* Take out the wallchart of the port (Week Thirteen). Use it as an illustration for this listening comprehension. Teach *cargo* (meaning boxes that ships carry). Check the other important words such as *port, cranes, sailors, hook, rope, thick, handle, fix, wave, lifts up.*

Teacher **Mr Mfundo went to Durban. He went to the port. He saw the ships. Some ships were cargo ships. They carry boxes of oranges and boxes of apples. They carry the fruit to England. Mr Mfundo saw the cranes. He watched the sailors and the crane driver.**

Mr Mfundo talked to the sailors. He said, 'I write stories for the "Boys' and Girls' Weekly". Will you tell me what you are doing, please?'

Break off here and ask questions.

Teacher **Where did Mr Mfundo go? Did he see any ships? What were the ships carrying? Who did Mr Mfundo talk to?**

Now continue.

One sailor said, 'Can you see the big crane?' 'Yes,' said Mr Mfundo, 'It has a big hook on the end of a thick rope.' 'That's right,' said the sailor. 'And can you see those big boxes? 'Yes,' said Mr Mfundo. 'They are full of oranges.' 'That's right,' said the sailor. 'The crane driver pulls a handle and the hook comes down over a box.' 'I see.' said Mr Mfundo, 'The hook drops on to a big box of oranges.' 'Yes,' said the sailor. 'Then I fix the hook into the ropes round the orange box. I wave to the crane driver.' 'Then what does the crane driver do?' Mr Mfundo asked. 'The crane driver pulls another handle. The crane lifts up the box on the end of the big hook. Then the crane turns round and the driver drops the box on to the ship. He drops it down slowly. The big box goes into a big room in the ship.' 'Thank you,' said Mr Mfundo. 'I'll tell my boys and girls about your work.'

Now ask questions about the rest of the story.

What did the sailor show Mr Mfundo? Where was the hook? What was in the boxes? What did the crane do? Where did the crane driver drop the box? Did he drop it slowly or quickly? Is there a handle on the crane?

DAY 3

• Tell the pupils to open their Pupil's Books, page 66. Use the picture to teach the new vocabulary. Talk about the picture, then follow the usual routine for reading and answering the questions.

Writing

Put this exercise on the board. Tell the pupils to write out the sentences correctly, using capital letters, full stops, commas and question marks.

1 is monday the first day of the month
2 peter and joseph put some books pencils and rulers in their bags
3 how many tall buildings did you see in johannesburg
4 daniel mfundo has got a brother and a sister
5 we are going to a new school in january

Listening comprehension

The pupils will hear a short Bible story and answer questions on it. Check the main items of vocabulary first such as *bent/straight, reached, ache.*

Teacher **There was an old woman in a small village. She had a bent back. Her back bent down and she looked at the ground. She walked along with two sticks. She looked at the flowers, and the birds when they hopped on the grass, but she didn't see the tall trees or the birds flying in the air. Her back hurt when she moved about.**

One day Jesus came to the village to talk to the people in the church. The church was at the top of a small hill outside the village. Jesus walked along the road to the church and all the people in the village walked behind him. The old woman went behind all the people because she wanted to listen to Jesus. She walked slowly and when she reached the church Jesus was reading the last pages of his book.

The people knelt on the ground. They looked up at Jesus. Jesus looked at all the faces but he did not see the face of the old woman because her head bent down to the ground. Jesus called to her, 'Why don't you look at me, old woman?' 'I can't raise my head, Jesus. I walk with sticks and my back is bent,' she said.

'Come to me, old woman,' said Jesus. The old woman walked slowly to Jesus and Jesus put his hands on her back. 'Stand up straight, good woman, and give thanks to God,' said Jesus. The woman felt the ache go away from her back. She raised her arms above her head and thanked Jesus and God. All the people in the church were happy. They had a party in the village that night.

Now ask questions about the story.

Teacher **Was the old woman's back bent or straight? Did she use sticks to walk along the road? Could she see the tall trees and the birds in the sky? Who came to the village? Where was the church? Did the old woman want to listen to Jesus? What was Jesus doing when she reached the church? Why couldn't he see the old woman? Did Jesus call the old woman to him? What did he say to the old woman?**

Go over the words with the pupils.

Did Jesus make her back straight again? Did the people in the village have a party that night?

APPENDIX 8: THRESHOLD SPECIMEN SCIENCE MATERIAL

LESSON 2: THE STRUCTURE AND THE FUNCTIONS OF THE PARTS OF PLANTS

READ THIS

All plants have roots, a stem or many stems, leaves, flowers or fruits and seeds. We are going to look at these parts of the plant.

1. Roots

The roots of the plant are always under the ground. They grow downwards into the soil.

Roots have two functions. Firstly, roots keep the plant in the ground. We say that roots anchor the plant in the ground. Secondly, roots take water and salts from the soil.

There are two different kinds of roots. You will learn more about this later.

2. Stems

All stems grow upwards towards the light. They do not grow down into the soil like roots.

How many stems does a plant have?

A plant can have _____ or _____ stems.

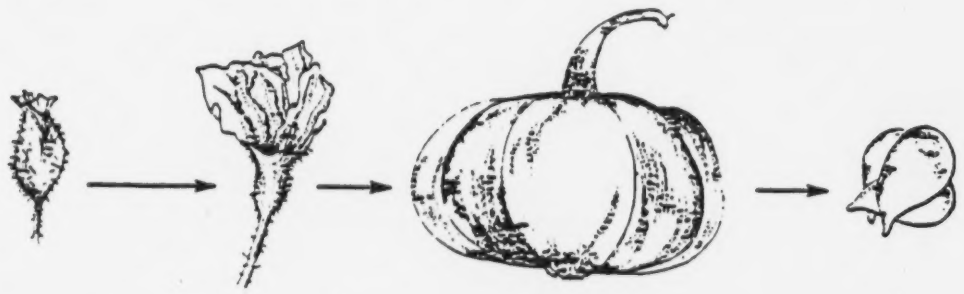
3. Leaves

Leaves grow from nodes on stems. They can have many different colours. For example, there are light green leaves, dark green leaves, yellow leaves and leaves with a red colour.

Leaves have smooth or rough edges. Leaves also have many different shapes. You will learn more about this later.

4. Flowers, fruits and seeds

Leaves grow on stems. Buds also grow on a stem. These buds grow into flowers. We say that they develop into flowers. The flower develops into a fruit. The fruit holds the seeds that can grow into a new plant. Look at picture 1.



Picture 1: A flower becomes a fruit. A fruit holds seeds.

Fruits of plants can be dry or juicy. We can eat many of the juicy fruits, like oranges, apples and tomatoes. We can also eat many of the seeds of plants, like mealie seeds, sunflower seeds and peanuts.

Do you know two other fruits and two other seeds that we can eat? Write them down in the spaces.

Fruits we can eat	Seeds we can eat
orange apple tomato	mealie seed sunflower seed peanuts
_____	_____
_____	_____

HOMEWORK

What happened in the story BETSY IN THE FOREST ? Here are four sentences about the story. The sentences are in the wrong order. You must put them into the right order. Write 1 in the box next to the sentence that happened first. Write 2 in the box next to the sentence that happened after 1. Now write 3 and 4 in their boxes.

☐ First they visited the roots.

☐ Lastly Betsy and Mr Cloud talked to the pretty flowers.

☐ Mr Cloud took Betsy to a forest.

☐ After that they went to the stems and leaves.

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